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# City Council of Gibraltar.

# ANNUAL REPORT

ON THE

# HEALTH OF GIBRALTAR

FOR THE YEAR

## 1935,

BY

Major R. A. MANSELL, M.B.E., M.B., D.P.H., D.T.M. & H.,
Royal Army Medical Corps.
Medical Officer of Health.

with which is included
the Report of the City Analyst and Bacteriologist,
and the Report of the Veterinary Adviser.

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# CITY COUNCIL OF GIBRALTAR.

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‡ *Maternity and Child Welfare.*
Medical Officer i/c —The Medical Officer of Health.
Midwife —Mrs. A. Gonzalez.
Health Visitor —Mrs. A. Gonzalez.

---

* Occasional.
† Cert. Royal Sanitary Institute.
§ Cert. Inspector of Meat and Other Foods.
‡ Mainly maintained by Government Grants.

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*Assistant Surgeons.*

J. E. DEALE, Esq., M.B., Ch.B., B.A.O., F.R.C.S.I.

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*Extra Assistant Surgeon.*

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*Public Vaccinator.*

* L. H. GILL., Esq., L.R.C.P., L.R.C.S. (Edin.).

*Port Surgeon.*

* A. A. RUSSO, Esq., L.R.C.S.I., L.R.C.P.I.

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The Medical Officer of Health.

*Medical Inspector of Schools.*

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*School Dentist.*

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*District Medical Officers.*

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* J. DOTTO, Esq., M.R.C.S., L.R.C.P.

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* Allowance paid to private medical practitioners as a retaining fee for their services.

# BOARD OF HEALTH.

H.E. the Governor (Chairman).

The Hon. Colonial Secretary.

The Deputy Director of Medical Services.

The Senior Naval Medical Officer, Gibraltar Command.

The Captain of the Port.

The Port Surgeon.

The Colonial Surgeon.

The Medical Officer of Health.

The Chairman, City Council.

The President, Exchange Committee.

The President, Chamber of Commerce.

Secretary—H. J. S. Norton, Esq., M.B.E.

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# PREFACE.

---

*The health of Gibraltar during 1935, was, on the whole, good.*

*As a corrective to the record low death rate of 1934, that of last year was slightly above the average of the preceding five years: a feature under this heading is the comparatively large number of deaths reported from cancer.*

*An alteration has been made, as will be seen in the text of my Report, in the calculation of the infantile mortality rate. It stands at 67.4 per 1,000 live births; and for many reasons, some of them obvious, is higher than the United Kingdom rate of 57.*

*The outbreak of diphtheria recorded at the end of 1934, carried over to the beginning of 1935, and a small outbreak of measles of a mild type occurred at the end of the summer. The zymotic death rate was satisfactorily low at 0.35 per 1,000.*

*A discussion on the source of the water in the new wells at North Front is included in my Report: the value of these wells has been especially notable during the particularly dry year just past.*

*I wish to record my appreciation of the work and loyalty of the staff of my Department, and of the helpful co-operation of all other Departments of the Council. My thanks are also due to the local press for their support in general matters affecting public health.*

*The Reports of the City Analyst and Bacteriologist and of the Veterinary Adviser are appended.*

*R. A. Mansell,*
*Major, R.A.M.C.,*
*Medical Officer of Health.*

*Public Health Department,*

*Gibraltar, 6th May, 1936.*

# CITY COUNCIL OF GIBRALTAR.

## PUBLIC HEALTH DEPARTMENT.

### SUMMARY OF VITAL STATISTICS FOR 1935.

| | |
|---|---|
| Total area of Gibraltar Territory ... ... | 1,387 acres,<br>2 roods, 3 poles |
| Area of the City ... .. ... ... ... ... | 104 acres,<br>3 roods, 33 poles. |
| Estimated Total Civil Population of Gibraltar | 16,865 persons. |
| Estimated Fixed Civil Population of Gibraltar | 15,735 persons. |
| Births in Fixed Civil Population ... ... | 138 Males.<br>129 Females. |
| Total Births ... ... ... ... ... ... ... ... | 267. |
| Birth rate per 1,000 of Fixed Civil Population | 16·9. |
| Deaths in Fixed Civil Population ... ... | 132 Males.<br>133 Females. |
| Total Deaths... ... ... ... ... ... ... ... | 265. |
| Crude death rate per 1,000 of Total Civil Population... ... ... ... ... ... ... | 15·71. |
| Average crude death rate for previous ten years ... ... ... ... ... ... ... ... | 15·5. |
| Death rate from Pulmonary Tuberculosis ... | 0·95 per 1,000. |
| Infantile Mortality rate ... ... ... ... ... | 67·4 per 1,000 births. |

# METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1935.

---

Latitude 36° 6′ N. Longitude 5° 21′ W.

Below is a summary of the main observations recorded during the year; fuller details are shewn in the Tables which follow.

| | |
|---|---|
| Rain season 1934-35 .................. | 25.94 inches |
| Rain during calendar year 1935 ... | 22.77 ,, |
| Number of days with 0.1 inch of rain or more ...................... | 71 |
| Number of days with 0.4 in. of rain or more ............................ | 61 |
| Wettest day ............................ | Dec. 24—1.50 ins. |
| Highest recorded shade temperature | 97°F—July 31 |
| Lowest recorded temperature ...... | 33°F—Feb. 10 |
| Lowest temperature on the grass... | 25°F |
| Mean temperature for the year ... | 63.0°F |
| Mean relative humidity for the year .................................. | 72 per cent. |
| Mean amount of cloud .............. | 3.9 |
| Number of days of clear sky ... | 63 |
| Number of days of overcast sky ... | 38 |
| Number of days with thunderstorm | 4 |
| Number of days with fog ........... | 8 |
| Number of days with frost ......... | 2 |
| Number of occasions when hail fell | 4 |
| Number of gales or gale gusts ...... | 4 |
| Mean corrected barometric reading | 30.050 ins. |
| Highest corrected barometric reading .................................. | 30.425 ins.—Jan. 1 |
| Lowest corrected barometric reading .................................. | 29.352 ins.—Dec. 24 |

The outstanding feature is the low rainfall which at 22.77 was 3.34 inches below the preceding year and 12.90 ins. below the average. From the point of view of water storage—the all-important one—the situation was not quite so serious as these figures indicate owing to the occurrence of appreciable rains comparatively late in the rain year. Where an inch of rain represents, on an average, 600,000 gallons of potable water in the reservoirs two successive years of deficiency begin to appear serious, and in fact would have been extremely so had it not been for the development of underground supplies which is commented on later in this report (vide page 30).

## TABLE I.

| Month | Barometric pressure reduced to sea level & 32° Fahr. Inches. | Maximum and Minimum Temperatures. | | | Difference from average for 40 years. °F. | Maximum date. | Minimum date. |
|---|---|---|---|---|---|---|---|
| | | Maximum °F. | Minimum °F. | Mean °F. | | | |
| Jan. | 30·125 | 59·8 | 47·6 | 53·7 | — 1·7 | 66—1, 2 & 5th | 35—29th |
| Feb | 30·177 | 61·4 | 47·3 | 54·3 | — 1·4 | 67—15 & 17th | 33—10th |
| Mar. | 30·089 | 63·4 | 53·2 | 58·3 | + 0·4 | 71—30th | 43—13th |
| April | 30·054 | 71·1 | 53·8 | 62·5 | + 1·8 | 82—14th | 47—7th |
| May | 29·956 | 70·4 | 56·4 | 63·4 | — 2·0 | 79—2nd | 51—22 & 23rd |
| June | 30·061 | 78·9 | 62·4 | 70·7 | + 0·6 | 92—22nd | 58—1, 2 & 16th |
| July | 30·017 | 83·7 | 69·4 | 76·5 | + 1·8 | 97—31st | 63—7th |
| Aug. | 29·956 | 83·0 | 70·5 | 76·7 | + 0·4 | 96—1st | 64—29 & 30th |
| Sept. | 30·048 | 81·2 | 66·7 | 74·0 | + 1·0 | 94—9th | 61—4th |
| Oct. | 30·039 | 72·1 | 58·4 | 65·3 | — 2·8 | 79—1 & 29th | 51—27th |
| Nov. | 30·041 | 65·2 | 54·4 | 59·8 | — 0·5 | 73—2nd | 48—20th |
| Dec. | 30·045 | 57·5 | 51·3 | 54·4 | — 2·5 | 65—1st | 42—16th |
| Year... | 30·050 | 70·6 | 57·6 | 64·1 | — 0·2 | 97—31st | 33—10th |

## TABLE II.

| Month. | Shade Temperature—°F. | | | Humidity % | | |
|---|---|---|---|---|---|---|
| | 7th hour. | 13th hour. | 21st hour. | 7th hour. | 13th hour. | 21st hour. |
| January .. | 49·9 | 57·9 | 51·6 | 76 | 62 | 74 |
| February... | 48·6 | 58·9 | 52·7 | 78 | 59 | 72 |
| March ...... | 54·3 | 60·3 | 56·9 | 80 | 69 | 76 |
| April ...... | 55·1 | 67·7 | 61·2 | 78 | 54 | 67 |
| May......... | 57·9 | 66·8 | 60·9 | 83 | 64 | 75 |
| June......... | 64·3 | 74·4 | 67·2 | 80 | 55 | 70 |
| July .. .. ... | 71·3 | 79·6 | 74·0 | 77 | 63 | 74 |
| August .... | 71·7 | 79·0 | 74·3 | 79 | 65 | 73 |
| September. | 67·9 | 77·4 | 70·8 | 81 | 60 | 74 |
| October ... | 59·7 | 70·0 | 62·6 | 79 | 60 | 74 |
| November. | 55·7 | 63·6 | 57·9 | 84 | 69 | 80 |
| December.. | 53·9 | 57·7 | 54·7 | 78 | 68 | 78 |
| Year ........ | 59·2 | 67·8 | 62·1 | 79 | 62 | 74 |

## TABLE III.

| Month | Terrestrial Radiation.<br>Temperature on the grass. | | | Solar Radiation.<br>Black bulb in vacuum. | | |
|---|---|---|---|---|---|---|
| | Mean °F. | Min. °F. | Date. | Mean °F. | Max. °F. | Date. |
| January ... | 42·8 | 30 | 29th | 93 | 119 | 17th |
| February... | 41·3 | 25 | 10th | 100 | 120 | 19th |
| March ...... | 48·8 | 37 | 12th & 13th | 92 | 123 | 30th |
| April ........ | 48·8 | 40 | 7th | 116 | 130 | 28th |
| May ......... | 52·5 | 46 | 5th & 6th | 110 | 136 | 2nd |
| June ......... | 60·0 | 54 | 14th | 123 | 135 | 22nd |
| July ......... | 67·6 | 60 | 7th | 120 | 149 | 31st |
| August. ... | 69·3 | 60 | 29th | 116 | 140 | 11th |
| September | 64·1 | 57 | 4th | 117 | 143 | 9th |
| October ... | 57·3 | 46 | 27th | 109 | 129 | 8th & 12th |
| November.. | 51·5 | 44 | 20th | 94 | 123 | 5th |
| December.. | 46·9 | 38 | 13th | 90 | 111 | 4th & 28th |
| Year ...... | 54·2 | 30 | 29th Jan. | 107 | 149 | 31st July |

## TABLE IV.

| Month. | Cloud amount 0–10. | | | Clear sky days. | Overcast days. |
|---|---|---|---|---|---|
| | 7th hour. | 13th hour. | 21st hour. | Less than 0·2 cloud. | More than 0·8 cloud. |
| January .. | 5·0 | 4·6 | 3·0 | 4 | 3 |
| February... | 3·5 | 4·0 | 2·2 | 6 | 3 |
| March ...... | 6·3 | 5·7 | 4·1 | 4 | 7 |
| April ........ | 3·8 | 3·1 | 2·1 | 7 | 1 |
| May ...... | 5·2 | 5·7 | 3·3 | 3 | 3 |
| June ......... | 3·1 | 2·2 | 1·8 | 8 | 1 |
| July ......... | 3·4 | 2·5 | 1·9 | 12 | 1 |
| August ..... | 4·1 | 3·7 | 3·0 | 6 | 2 |
| September | 5·4 | 3·0 | 2·3 | 5 | 3 |
| October ... | 3·9 | 3·9 | 2·8 | 5 | 3 |
| November | 6·4 | 5·8 | 5·2 | 1 | 7 |
| December.. | 5·4 | 5·6 | 3·6 | 2 | 4 |
| Year ........ | 4·6 | 4·2 | 2·9 | 63 | 38 |

## TABLE V.

| Month. | Rainfall 1935. | | Greatest fall in 24 hours beginning at 7 a.m. | | Number of days with ·01 inches or more. | Number of days with ·04 inches or more. | Rain Season. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1934–35 | |
| | Total inches. | Deviation from average inches. | Inches. | Date. | | | Month. | Total inches. |
| Jan. ..... | 2·36 | —2·32 | 0·69 | 10th | 8 | 6 | Aug. ... | 0·00 |
| Feb ....... | 1·29 | —2·91 | 0·56 | 25th | 8 | 7 | Sept. ... | 0·01 |
| March ... | 1·66 | —3.14 | 0·99 | 20th | 8 | 6 | Oct. ... | 1·27 |
| April ... | 1.74 | —0·94 | 0·63 | 28th | 4 | 4 | Nov ... | 9·30 |
| May....... | 4.70 | +2·95 | 1·40 | 22nd | 11 | 9 | Dec. ... | 3·44 |
| June... . | 0·17 | —0·30 | 0·08 | 26th | 3 | 3 | Jan. . | 2·36 |
| July . .... | 0·00 | —0·04 | 0·00 | — | 0 | 0 | Feb. ... | 1·29 |
| August... | 0·06 | —0·04 | 0·05 | 8th | 2 | 1 | Mar. ... | 1·66 |
| Sept. ... | 0·85 | —0·51 | 0·74 | 29th | 3 | 2 | April .. | 1·74 |
| October.. | 1·97 | —1·31 | 1·21 | 4th | 5 | 5 | May ... | 4·70 |
| Nov...... | 4·30 | —2·08 | 0·95 | 24th | 15 | 13 | June ... | 0·17 |
| Dec....... | 3·67 | —1·90 | 1·50 | 24th | 4 | 5 | July ... | 0·00 |
| Year ..... | 22·77 | —12·90 | 1·50 | 24th Dec. | 71 | 61 | Rain Season | 25·94 |

## TABLE VI.

| Month. | Winds obs. at 7-13-21 hr. 1098=year. | | | | | | | | Calm. | Forces 1—3 | Forces 4—7 | Forces 8 or more |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | | | | |
| January .. | — | 5 | 39 | 2 | 3 | 3 | 17 | 20 | 4 | 49 | 40 | — |
| February... | 1 | — | 12 | 2 | 2 | 5 | 39 | 19 | 4 | 48 | 32 | — |
| March ... .. | — | — | 53 | 8 | 4 | 7 | 7 | 13 | 1 | 43 | 49 | — |
| April ....... | 1 | — | 20 | 4 | 22 | 9 | 19 | 8 | 7 | 12 | 71 | — |
| May ...... . | — | — | 13 | 2 | 6 | 24 | 37 | 8 | 3 | 71 | 19 | — |
| June......... | — | — | 27 | 8 | 7 | 10 | 34 | 1 | 5 | 75 | 10 | — |
| July ......... | — | — | 44 | 6 | 5 | 10 | 20 | 0 | 9 | 69 | 16 | — |
| August .... | — | 1 | 51 | — | — | 6 | 29 | 3 | 3 | 79 | 11 | — |
| September. | — | — | 43 | 2 | 6 | 9 | 16 | 1 | 13 | 71 | 6 | — |
| October ... | 1 | — | 33 | — | 5 | 12 | 20 | 17 | 5 | 63 | 25 | — |
| November . | 1 | 1 | 16 | — | 1 | 14 | 37 | 19 | 1 | 65 | 24 | — |
| December... | — | — | 1 | — | — | 7 | 47 | 33 | 3 | 28 | 62 | — |
| Year......... | 4 | 7 | 352 | 34 | 61 | 116 | 322 | 142 | 58 | 673 | 365 | — |

## VITAL STATISTICS

The figures used in calculating the following rates are based on an estimate by the Police authorities at the end of the year: the Naval and Military garrison and their wives and families are not included in these figures.

### POPULATION.

The following figures refer to the resident population of Gibraltar and represent the state between 10.0 p.m. and 6.0 a.m. In addition to these there is a daily influx of some 5,000 aliens and 1,500 British subjects resident in La Linea, the frontier town of Spain, who come to the Colony for work or trade.

| | |
|---|---|
| British subjects— | |
| Other than Maltese | 15,657 |
| Maltese | 78 |
| Aliens— | |
| Resident in the City | 994 |
| Resident in the Bay | 136 |
| Total Population ... | 16,865 |

The fluctuations of the population during recent years are shewn below.

| How estimated. | British Subjects Fixed Population. | Alien Subjects Floating Population. | Total Population. |
|---|---|---|---|
| Census June, 1921 | 16,753 | 1,787 | 18,540 |
| Police Estimate at end of 1922 | 16,182 | 1,145 | 17,327 |
| Police Estimate at end of 1923 | 16,165 | 1,181 | 17,346 |
| Police Estimate at end of 1924 | 16,1 | 1,147 | 17,324 |
| Police Estimate at end of 1925 | 16,127 | 1,161 | 17,288 |
| Police Estimate at end of 1926 | 16,150 | 1,013 | 17,163 |
| Police Estimate at end of 1927 | 16,120 | 1,076 | 17,196 |
| Police Estimate at end of 1928 | 15,719 | 1,112 | 16,831 |
| Police Estimate at end of 1929 | 15,647 | 1,052 | 16,699 |
| Police Estimate at end of 1930 | 15,526 | 922 | 16,448 |
| Census April 1931 | 16,188 | 1,425 | 17,613 |
| Police Estimate at end of 1932 | 15,143 | 1,466 | 16,609 |
| Police Estimate at end of 1933 | 15,071 | 1,326 | 16,397 |
| Police Estimate at end of 1934 | 14,790 | 1,057 | 15,847 |
| Police Estimate at end of 1935 | 15,735 | 1,130 | 16,865 |

## VITAL STATISTICS DURING 1935 AND PREVIOUS TEN YEARS.

| Year | Population. | | | Deaths | | | | Infantile Mortality. | | Births. | | Zymotic Mortality. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed. | Total. | How Estimated | Fixed population. No. | Total population. No. | Rate per 1,000 of population. | | No. | Rate per 1,000 births. | No. | Birth rate per 1,000 living of Fixed population. | No. | Rate per 1,000 livingof Fixed population. |
| | | | | | | Fixed population. | Total population. | | | | | | |
| 1925 | 16127 | 17288 | Police Estimate | 249 | 256 | 15·44 | 14·80 | 31 | 83·0 | 372 | 23·0 | 10 | ·52 |
| 1926 | 16150 | 17163 | | 271 | 276 | 16·78 | 16·08 | 46 | 107·0 | 427 | 25·0 | 20 | 1·2 |
| 1927 | 16120 | 17196 | | 291 | 297 | 18·05 | 17·27 | 36 | 99·1 | 363 | 22·0 | 13 | ·8 |
| 1928 | 15719 | 16831 | | 286 | 293 | 18·19 | 17·40 | 45 | 122·9 | 366 | 23·2 | 30 | 1·7 |
| 1929 | 15647 | 16699 | | 254 | 262 | 16·36 | 15·68 | 18 | 46·6 | 388 | 24·7 | 10 | ·63 |
| 1930 | 15526 | 16448 | | 240 | 240 | 15·6 | 14·5 | 25 | 71·3 | 349 | 22·4 | 8 | ·51 |
| 1931 | 16188 | 17613 | | 250 | 254 | 15·4 | 14·4 | 23 | 61·0 | 377 | 23·28 | 4 | ·24 |
| 1932 | 15143 | 16609 | | 245 | 259 | 16·17 | 15·59 | 21 | 60·69 | 346 | 22·84 | 16 | ·96 |
| 1933 | 15071 | 16397 | Census | 241 | 245 | 15·99 | 14·94 | 14 | 39·2 | 357 | 23·68 | 3 | ·18 |
| 1934 | 14790 | 15847 | Police Estimate | 225 | 230 | 15·21 | 14·51 | 21 | 54·8 | 383 | 25·8 | 6 | ·37 |
| 1935 | 15735 | 16865 | | 255 | 265 | 16·20 | 15·71 | 18 | 67·4 | 267 | 16·9 | 6 | ·35 |

The age and sex distribution of the population in 1935, was as follows :—

| | Persons of 10 years of age and over. | | Persons under 10 years of age. | |
|---|---|---|---|---|
| | Males. | Females. | Males. | Females. |
| British Subjects | 5,233 | 6,281 | 2,060 | 2,083 |
| Maltese | 59 | 19 | | |
| Aliens in the Town | 247 | 747 | | |
| Aliens in the Bay | 136 | | | |
| Totals | 5,675 | 7,047 | 2,060 | 2,083 |

Total Males 7,735; Females 9,130.

## DEATHS.

The number of deaths registered among the resident British population was 255; in addition 10 deaths occurred of resident aliens, making a total of 265, and providing a death rate of 16.20 per thousand of the fixed population.

The crude death rate for the last ten years has been :—

| Year | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|---|---|---|---|---|---|
| Fixed Population | 16·78 | 19·05 | 18·19 | 16·36 | 15·60 | 15·40 | 16·17 | 15·99 | 15·21 | 16'20 |
| Total Population | 16·08 | 17·27 | 17·40 | 15·68 | 14·50 | 14·40 | 15·59 | 14·94 | 14·51 | 15·71 |

## MONTHLY AND QUARTERLY MORTALITY.

The highest number of deaths was recorded in January and the lowest in June and November, as shewn below.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| January | 35 | April | 23 | July | 23 | October | 19 |
| February | 28 | May | 21 | August | 17 | Nov. | 15 |
| March | 30 | June | 15 | Sept. | 17 | Dec. | 22 |
| | — | | — | | — | | — |
| | 93 | | 59 | | 57 | | 56 |

The excess in the first quarter over the remaining three is marked.

Apart from the general total rise of the death rate in comparison with last year—and it is interesting to note that since 1929 this rise has exhibited a three-year periodicity—the outstanding feature amongst the individual causes of death is the comparatively large number of cases of which cancer was the cause. Since 1930 the following numbers of deaths have been attributed to this cause :—

| Year | England & Wales rate per 1,000 | Gibraltar | | | |
|---|---|---|---|---|---|
| | | Males | Females | Total | Rate per 1,000 |
| 1930 | | 9 | 6 | 15 | 0 92 |
| 1931... | 1.48 | 18 | 8 | 26 | 1.50 |
| 1932... | 1.51 | 9 | 9 | 18 | 1.08 |
| 1933... | 1.53 | 11 | 9 | 20 | 1.22 |
| 1934... | 1.56 | 6 | 8 | 14 | 0.88 |
| 1935... | | 16 | 19 | 35 | 2.07 |

It will be seen from the Table, as is well known, that this group of disease causes deaths, in the main, at over the age of 40. There is, also, apparent in this short series a biennial rise and fall.

The locations of the primary growths, in those cases in which the information is available, are recorded as :—

| | Males | Females | |
|---|---|---|---|
| Female generative .......................... | — | 6 | |
| Breast .................................... | — | 3 | |
| Stomach .................................. | 6 | 3 | |
| Intestines and abdominal organs...... | 4 | 4 | |
| Bones ...................................... | 1 | 1 | |
| Lungs and mediastinum.................. | 3 | 1 | |
| Tongue and mouth ........................ | 2 | — | |
| Carcinomata .................... | 15 | 17 | = 32 |
| Sarcomata ...................... | 1 | 2 | = 3 |

## Causes of deaths in 1935 in Civil population, according to the International Abbreviated List, with Age and Sex incidence.

| Cause of Death. | All Ages | Under 1 year. | | 1 year and under 2. | | 2 years and under 5. | | 5 years and under 15 | | 15 years and under 25 | | 25 years and under 45. | | 45 years and under 65 | | 65 years and over. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F |
| 1 Typhoid Fever ... | 2 | — | — | — | — | — | — | — | — | 1 | 1 | | — | — | — | — | — |
| 8 Diphtheria ... .. | 1 | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — |
| 9 Influenza ... ... | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 |
| 12 Other epidemic diseases. ... ... | 2 | — | — | | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — |
| 13 Tuberculosis of respiratory system ... | 15 | — | — | — | — | — | — | — | — | 2 | — | 4 | 2 | 5 | 2 | · | — |
| 14 Tuberculosis of nervous system ... | 1 | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — |
| 15 Other Tuberculous diseases ... ... | 2 | — | | — | — | 2 | — | — | — | — | — | — | — | — | — | — | — |
| 16 Cancer, Malignant tumours ... ... | 35 | — | — | — | — | — | — | — | 1 | — | — | 1 | 1 | 9 | 6 | 6 | 11 |
| 17 Meningitis ... ... | 1 | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — |
| 18 Haemorrhage, apoplexy, and softening of brain ... | 30 | — | — | — | — | — | 1 | — | — | — | — | 2 | 1 | 5 | 3 | 4 | 14 |
| 19 Heart diseases ... | 42 | — | — | — | — | | — | 1 | 1 | 1 | 1 | 2 | — | 9 | 7 | 6 | 14 |
| 20 Acute bronchitis ... | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 1 |
| 21 Chronic bronchitis ... | 5 | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | 2 | — |
| 22 Pneumonia ... ... | 15 | 1 | — | 3 | — | 1 | — | — | — | — | 1 | — | — | — | 4 | 1 | 4 |
| 23 Other diseases of the respiratory system ... | 11 | 3 | — | 2 | — | — | — | 1 | — | | — | — | — | — | 2 | 1 | 2 |
| 24 Diseases of the stomach ... ... | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 2 | - | — | — |
| 25 Diarrhœa and Enteritis (under 2 years) ... ... | 3 | 2 | 1 | — | — | — | — | — | — | — | — | — | — | — | | — | — |
| 27 Hernia, intestinal obstruction ... | 4 | — | — | — | — | — | — | — | 1 | — | — | — | — | | — | 1 | 2 |
| 29 Acute and chronic nephritis ... ... | 12 | — | — | — | — | — | — | — | — | — | — | — | — | 4 | 2 | 4 | 2 |
| 32 Other accidents of pregnancy and parturition ... | 3 | — | — | — | — | — | — | — | — | — | — | — | 2 | — | 1 | | — |
| 33 Congenital debility and malformations | 8 | 6 | 2 | — | | — | - | — | — | — | — | — | — | — | — | — | — |
| 34 Old Age ... ... | 20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | 17 |
| 35 Violent deaths (suicide excepted) | 8 | — | - | — | 1 | — | — | — | — | 1 | — | 5 | — | 1 | — | — | — |
| 36 Suicide ... ... | 1 | — | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | — |
| 37 Other diseases ... | 34 | 1 | 1 | — | — | — | — | — | — | — | — | 1 | 1 | 10 | 7 | 5 | 8 |
| 38 Diseases not stated or ill-defined ... | 5 | 1 | — | — | — | — | — | — | — | — | — | 1 | 1 | 1 | — | — | 1 |
| Totals ... ... | 265 | 14 | 4 | 5 | 1 | 3 | 1 | 4 | 4 | 5 | 3 | 17 | 8 | 50 | 35 | 34 | 77 |

## MATERNITY AND CHILD WELFARE

The figures and rates recorded in this section for many years past have been records of events which have occurred in the City; but as has been noted above, there is a considerable population which for mere lack of space cannot reside therein. The Table on page 6 shews that in spite of a healthy birth rate and a satisfactorily low death rate the total resident population does not appreciably alter; not only is living accommodation filled practically to saturation point, but possible building sites are almost so also. Those who are thus forced to dwell in the neighbourhood in Spain in many cases, either for sentimental reasons, or to ensure the political rights of their children, or because they appreciate the local maternity service, come temporarily to Gibraltar for their confinements and return to Spain very shortly afterwards. It is manifestly incorrect to include these births with those of the resident population for statistical purposes. The following figures, therefore, refer solely to happenings proper to the permanent resident population, and are not comparable with the records of previous years.

BIRTHS.

Two hundred and sixty-seven infants were born during 1935; of these 138 were males and 129 females. The birth rate per 1,000 of the population was 16.9.

INFANT MORTALITY.

The deaths of 18 infants under one year of age were recorded, providing an infant mortality rate of 67.4 per 1,000 births; the corresponding rate for England and Wales for 1935 was 57.

The causes of these infant deaths is shewn in the following table:—

| Cause of Death. | Under 1 week. | 1 week and under 2. | 2 weeks and under 3. | 3 weeks and under 4. | Total under 4 weeks. | 1 month and under 3. | 3 months and under 6. | 6 months and under 9. | 9 months and under 12. | Total under 1 year. |
|---|---|---|---|---|---|---|---|---|---|---|
| Diarrhœa and Enteritis... | — | — | — | — | — | 1 | 1 | 1 | — | 3 |
| Congenital Debility and Malformations ......... | 4 | — | 1 | — | 5 | 1 | 1 | — | 1 | 8 |
| Pneumonia .............. | — | — | — | — | — | — | 2 | 1 | 1 | 4 |
| Other causes ............... | 1 | 1 | — | 1 | 3 | — | — | — | — | 3 |
| Totals ... ... | 5 | 1 | 1 | 1 | 8 | 2 | 4 | 2 | 2 | 18 |

There were twenty-two still-births.

## MATERNITY SERVICES.

Two hundred and twenty-five women were treated at the special ward of the Colonial Hospital—99 of these were members of the local population and 126 from those at present resident in La Linea, Spain. These admissions provided 95 and 108 births respectively.

There are eight midwives on the register, subject to periodical inspection by the Medical Officer of Health. Their duties have been performed in a satisfactory manner; no case of puerperal pyrexia or sepsis having been recorded throughout the year. They attended 151 live births, or 56.5 per cent. of the total number.

One of these midwives, under contract with the Public Health Department, attends the confinements of persons unable either to meet the ordinary expenses or to enter the Colonial Hospital. The cost of her attendance is met from the special Government grant administered by the Medical Officer of Health. Seventeen cases were assisted in this way during the year. In addition, this midwife visits all confinement cases amongst the poorer classes after delivery to enquire into their conditions, to give advice and assistance, and, where possible, to urge attendance at the Welfare Centre in due course.

## CHILD WELFARE.

The Welfare Centre has now a well established popularity. Fortnightly meetings are held, and the average attendance for the year was 83. In addition to the recording of weights and the issuing of milk, etc., at reduced prices or free, according to the circumstances of the parents, the advice and instruction given by the nurse is followed up in special cases by home visiting. Three hundred and eighty-nine such visits were paid during the year.

The following quantities of milk, etc., were issued during the year:—

| | |
|---|---|
| Milk ........................................ | 4,008 tins. |
| Virol, Glaxo, etc. ........................ | 41 pots. |
| Feeders .................................. | 63 No. |

The Centre is financed by a grant from the Government and by the small sums paid by a proportion of those attending for the foods issued. Recently its increasing popularity has tended to outgrow its financial capacity, and it has been necessary to restrict attendances to the first year of life except in special cases in which the poverty of the parents or some disability of the infant has made extension desirable. As a result of this restriction, it has been possible to maintain a small financial balance and to give special aid to selected cases.

Care of the school children is in the hands of the medical and nursing staff of the Colonial Hospital, and the duties of school dentist are undertaken by Mr. Garesse.

During the winter months private charity, at the Soup Kitchen, provides a daily midday meal for school children.

During the year there were 179 children treated at the Childrens' Ward of the Colonial Hospital.

## PREVALENCE AND CONTROL OF INFECTIOUS DISEASES

Two hundred and forty-one cases of notifiable infective diseases were reported during the year; of these, one hundred and thirty-four were cases of measles.

Of the nineteen deaths from this group of diseases, fifteen were due to pulmonary tuberculosis, two to enteric fever, and one each to diphtheria and erysipelas.

The zymotic death rate was 0.35 per 1,000 of population.

QUARTERLY INCIDENCE OF NOTIFIABLE INFECTIOUS DISEASES.
CIVIL POPULATION.

| Disease | 1st Qr. | 2nd Qr. | 3rd Qr. | 4th Qr. | Total | Deaths |
|---|---|---|---|---|---|---|
| Diphtheria .................. | 20 | 4 | 2 | 2 | 28 | 1 |
| Enteric Fever ... . ......... | 1 | 2 | 5 | 1 | 9 | 2 |
| Pulmonary Tuberculosis ... | 4 | 1 | 6 | 12 | 23 | 15 |
| Scarlet Fever .............. | 1 | 2 | 12 | 9 | 24 | — |
| Dysentery......... ..... . ... | — | 1 | 2 | 1 | 4 | — |
| Undulant Fever......... ... | — | — | — | 1 | 1 | — |
| Venereal Diseases .. ...... | 1 | — | — | — | 1 | — |
| Measles ......... .......... | 1 | 24 | 105 | 4 | 134 | — |
| Rubella ...... .............. | 2 | 2 | 2 | — | 6 | — |
| Chicken Pox .............. | 6 | 1 | 1 | 3 | 11 | — |
| Totals... . ...... | 36 | 37 | 135 | 33 | 241 | 18 |

## CASES LANDED FROM THE BAY OR BROUGHT INTO THE TOWN FOR TREATMENT.

| Disease | 1st Qr. | 2nd Qr. | 3rd Qr. | 4th Qr. | Total | Deaths |
|---|---|---|---|---|---|---|
| Enteric Fever ............... | 1 | — | 1 | — | 2 | — |
| Pulmonary Tuberculosis ... | 2 | — | — | 1 | 3 | — |
| Small Pox.................... | — | — | 1 | — | 1 | — |
| Dysentery.................. . | — | — | — | 1 | 1 | — |
| Totals ......... . | 3 | — | 2 | 2 | 7 | — |

## Age and Sex incidence of Notifiable Infectious Diseases amongst Civil Population during 1935.

| Notifiable Disease. | NUMBER OF CASES NOTIFIED. | | | | | | | | | | | | | | | Districts. | | | Total cases removed to Hospital. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | At all Ages | Under 1. | | 1 and under 5. | | 5 and under 15. | | 15 and under 25. | | 25 and under 45. | | 45 and under 65. | | 65 and Over. | | North. | Central. | South. | Residents. | Non-Residents. |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | | | | | |
| Diphtheria ... ... ... ... | 28 | — | 1 | 5 | 4 | 8 | 7 | — | 3 | — | — | — | — | — | — | — | 26 | 2 | 6 | — |
| Enteric Fever ... ... .. | 9 | — | — | — | — | 1 | 1 | 2 | 1 | 2 | 2 | — | — | — | — | — | 9 | — | 2 | 2 |
| Venereal Diseases ... .. | 1 | — | — | — | — | — | — | 1 | - | — | — | — | — | — | — | — | 1 | — | — | — |
| Pulmonary Tuberculosis ... | 23 | — | — | — | — | 2 | 1 | 2 | 4 | 5 | 4 | 4 | — | — | 1 | — | 20 | 3 | 3 | 3 |
| Chicken Pox .. ... ... ... | 11 | — | — | 1 | 4 | 2 | 4 | — | — | — | — | — | — | — | — | — | 11 | — | — | — |
| Scarlet Fever .. ... ... | 24 | — | — | 3 | 2 | 9 | 7 | — | 1 | — | 2 | — | — | — | — | 1 | 22 | 1 | — | — |
| Rubella ... ... ... .. | 6 | — | — | 1 | 1 | 1 | 2 | — | 1 | — | — | — | — | — | — | — | 5 | 1 | — | — |
| Dysentery .. ... ... ... | 4 | — | — | — | — | — | 1 | — | 1 | — | — | 1 | 1 | — | — | — | 4 | — | 2 | 1 |
| Undulant Fever ... ... ... | 1 | — | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | 1 | — | — | — |
| Measles ... ... ... ... | 134 | 4 | 2 | 37 | 39 | 31 | 18 | 1 | 1 | 1 | — | — | — | — | — | — | 132 | 2 | — | — |
| Totals ... ... ... | 241 | 4 | 3 | 47 | 50 | 54 | 41 | 6 | 12 | 9 | 8 | 5 | 1 | — | 1 | 1 | 231 | 9 | 13 | 6 |

## Monthly Notifications of Notifiable Infectious Diseases during 1935.—Civil Population.

| Months. | DISEASES. | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Diphtheria | | Enteric Fever | | Measles | | Pulmonary Tuberculosis | | Chicken Pox | | Scarlet Fever | | Rubella | | Dysentery | | Undulant Fever | | Venereal Diseases | |
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| January ... ... ... .. | 13 | — | 1 | — | 1 | — | — | 3 | — | — | — | — | — | — | — | — | — | — | 1 | — |
| February ... ... ... ... ... | 6 | — | — | — | — | — | 4 | 1 | 1 | — | 1 | — | — | — | — | — | — | — | — | — |
| March ... ... ... ... ... | 1 | — | — | — | — | — | — | — | 5 | — | — | — | 2 | — | — | — | — | — | — | — |
| April ... ... ... ... ... ... | — | — | — | — | — | — | — | 2 | — | — | — | — | 1 | — | 1 | — | — | — | — | — |
| May ... ... ... ... ... ... | 2 | 1 | 1 | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — |
| June ... ... ... ... .. ... | 2 | — | 1 | — | 24 | — | 1 | — | 1 | — | 1 | — | 1 | — | — | — | — | — | — | — |
| July ... ... ... ... ... ... | 2 | — | 1 | — | 43 | — | 2 | — | 1 | — | 2 | — | — | — | 1 | — | — | — | — | — |
| August ... ... ... ... ... | — | — | 2 | — | 53 | — | 2 | 1 | — | — | 6 | — | 1 | — | 1 | — | — | — | — | — |
| September ... ... ... ... ... | — | — | 2 | 1 | 9 | — | 2 | — | — | — | 4 | — | 1 | — | — | — | — | — | — | — |
| October ... ... ... ... | 1 | — | — | 1 | 1 | — | 8 | 3 | 2 | — | 5 | — | — | — | 1 | — | — | — | — | — |
| November ... ... ... ... ... | — | — | 1 | — | — | — | 2 | 2 | 1 | — | 3 | — | — | — | — | — | — | — | — | — |
| December ... ... ... ... ... | 1 | — | — | — | 3 | — | 2 | 3 | — | — | 1 | — | — | — | — | — | 1 | — | — | — |
| Totals ......... ......... | 28 | 1 | 9 | 2 | 134 | — | 23 | 15 | 11 | — | 24 | — | 6 | — | 4 | — | 1 | — | 1 | — |

### DIPHTHERIA.

Of the twenty-eight cases recorded, twenty occurred during the first quarter of the year as a continuation of the outbreak recorded in last year's report. On the whole the disease has been of a mild type and only one death occurred.

Diphtheria Antitoxin—

Approximately 580,000 units of anti-diphtheritic serum were issued to the Colonial Hospital and to medical practitioners during the year.

### ENTERIC FEVER.

Nine cases, with two deaths, occurred. The distribution of these cases by months is given in the preceding Table which shows that, as usual, the third quarter of the year is the time of maximal incidence.

Detailed investigations of these cases and of the persons normally in contact with them suggested strongly that five of them were attributable to infection contracted outside the Colony; but of the remainder did not provide any reasonable suggestion as to the actual source.

During the summer months a considerable outbreak occurred in a closely neighbouring town in Spain; and it is a matter of satisfaction that this did not affect Gibraltar.

### MEASLES.

The outbreak of measles which produced 134 cases fortunately occurred during the months June to September so that complications were few and mild and no deaths resulted. The majority of the cases occurred when the schools were shut so that, in a year when an epidemic was normally expected, all the circumstances were favourable to a mild and restricted course of the outbreak. This, of course, may have its repercussions later in that a larger proportion of children than is usual in these periodical outbreaks have not attained the immunity which results from an attack, and may, therefore, contract the disease later; at any rate such children will be a year older at least, and will so be better able to resist the dangerous complications.

### RABIES.

No cases occurred during the year. A notable advance is recorded later in this Report in that vaccine for treatment is now stocked by the Public Health Department, thanks to the assistance of the Director of the Pasteur Institute of Morocco.

### SMALL POX.

No cases occurred in the Colony. One case was landed from a steamship which arrived from a German port, and was treated in the Isolation Hospital.

VACCINATION- –

Three hundred and fifty-four primary vaccinations and two hundred and ninety revaccinations were performed during the year. Of the latter, 269 were on children who had attained the age of 12 years. The Public Vaccinator carried out 310 vaccinations and 272 revaccinations. Since the end of the preceding year he has used exclusively the single scar method with most satisfactory results and correspondingly decreased inconvenience to the subjects.

The following figures shew the vaccinations performed in relation to births during the year :—

| | |
|---|---|
| Number of children born | 267 |
| Died before vaccination | 12 |
| Left Gibraltar | 6 |
| Certified as insusceptible to vaccination | 1 |
| Vaccination postponed on medical grounds | 12 |
| Number successfully vaccinated | 193 |
| Objectors to vaccination | 1 |
| Outstanding (under 3 months of age) | 53 |

VENEREAL DISEASES.

Sixty-six cases were treated at the treatment centre established at the Colonial Hospital, during the year. Of these, 18 were mercantile seamen.

The number of intravenous injections given was 314.

Both the treatment at the Colonial Hospital and all laboratory investigations carried out at the City Council Public Health Laboratories (of which a detailed statement is given in the appropriate section of this Report) are free of charge.

PULMONARY TUBERCULOSIS.

Twenty-three cases and fifteen deaths were notified during the year. Of the notifications, thirteen were below the age of 35 years. Four of the deaths occurred during the same year as the original notification, and five were notified in the death certificate only.

The death rate per 1,000 of population for this disease alone during the past five years compares unfavourably with that of England and Wales.

| | England & Wales | Gibraltar |
|---|---|---|
| 1931 | 0.74 | 1.40 |
| 1932 | 0.68 | 1.18 |
| 1933 | 0.69 | 1.26 |
| 1934 | 0.62 | 1.20 |
| 1935 | | 0.88 |

To those accustomed to regard the diagnosis of pulmonary tuberculosis as a sentence to death which will be carried out inevitably and within, at the most, a short number of months, these figures may not appear to call for much criticism. So far as I have been able to become acquainted with it, this is the attitude which prevails here.

The National Tuberculosis Scheme for the Prevention and Treatment of Tuberculosis in the United Kingdom has been in action now since 1913. In comparison with the point of view just outlined it is of value to consider its results. The following are the death rates per 1,000 from this disease since the beginning of that Scheme in England and Wales:—

| | |
|---|---|
| 1913 | 1.012 |
| 1923 | 0.836 |
| 1934 | 0.635 |

In Gibraltar, from the records available since 1891, with the exception of the year now under review, this death rate has on only two occasions (1903 and 1907) been lower than 1.0.

Two facts should be realised: that in practically all other parts of the world organised schemes for the prevention and treatment of this disease are producing very considerable results, not only from the point of view of actual cures, but also in the prolongation of the comfortable and useful life of the infected persons, and, more important, in the protection from infection of those surrounding and in contact with these persons; secondly, that the chief place where tuberculosis is spread is in the home of the tuberculous patient.

I regret that it still has to be recorded that Gibraltar is without any effective working scheme.

## DESTITUTE SICK AND TUBERCULOSIS SCHEME

Whilst there can be little doubt that the ravages of tuberculosis are accentuated and accelerated by destitution, and that in many cases the line between health and disabling sickness is overstepped rapidly and finally in this disease in the blindness of poverty and malnutrition, there can really be little other excuse for the continuance of discussion of these two facts under one heading in this report. As has been the case for very many years past, all that is yet achieved towards the combating of tuberculosis from the public health point of view of the City as a whole is the recognition of individual cases as fitting to receive indoor or outdoor relief in the same manner as destitute persons. It would be fair to add, also, that during the year considerable additions have been made to the reports and recommendations previously written on this subject.

Apart from what has already been written in this Report on the subject of tuberculosis, it has to be borne in mind that a scheme for dealing with this disease has been formulated and is under consideration by the Government.

As it is at present, the expenditure under this combined heading is met from a grant made by the Government of the Colony; this is administered by the City Council under the immediate supervision of the Medical Officer of Health, who becomes thus the Relieving Officer. The great majority of the spade work of investigation and supervision of cases of destitution is carried out by the Sanitary Inspectors; and I would like here to pay a tribute to the care and impartiality with which they carry out these duties.

### OUTDOOR RELIEF—

The number of persons in receipt of relief, taking an average for the whole year, during the past five years has been :—

| | |
|---|---|
| 1931 | 72 |
| 1932 | 71 |
| 1933 | 86 |
| 1934 | 109 |
| 1935 | 131 |

The total quantities of relief issued during 1935 were :—

| | |
|---|---|
| Meat | 15,457 lbs. |
| Milk (fresh) | 10,934 pints |
| Milk (condensed) | 9,600 tins |

In addition, a few individuals in very special circumstances are granted small amounts of monetary assistance.

The total cost of Outdoor Relief was £987.

### INDOOR RELIEF—

The average number of persons accommodated in the Gibraltar Home for Sick and Aged was 38 males and 16 females; six of the former were notified cases of tuberculosis.

The average cost of feeding per head was 11¾d. per day, and the total all-in cost was calculated at 2s. 1¼d. per head per day.

The cost of the Home during 1935 was £2,127.

The whole question of the continuance of this institution has received considerable attention during the year both from the Government's and the City Council's points of view. The question is naturally bound up with that dealing with tuberculosis as certain destitute tuberculous persons are accommodated therein.

# SUMMARY OF INDOOR AND OUTDOOR EXPENDITURE FOR THE YEAR 1935

Indoor Relief—

| | | | | | | |
|---|---|---|---|---|---|---|
| Provisions | £1,001 | 7 | 9 | | | |
| *Miscellaneous | 469 | 7 | 5 | | | |
| Maintenance of Buildings | 77 | 11 | 1 | | | |
| Rent | 315 | 13 | 9 | | | |
| Clothing | 123 | 13 | 2 | | | |
| Light | 47 | 5 | 10 | | | |
| Water | 66 | 15 | 8 | | | |
| Funeral expenses | 9 | 0 | 0 | | | |
| Telephone | 12 | 0 | 0 | | | |
| Insurance | 1 | 10 | 0 | | | |
| Printing | 3 | 1 | 4 | £2,127 | 6 | 0 |

| | |
|---|---|
| Days of subsistence | 20,074 |
| Average number of inmates | 55 |
| Cost of feeding per head per day | 11¾d. |
| Cost of feeding per head per year | £18 4 1½d. |
| Total all-in cost per head per day | 2s. 1¼d. |
| Total all-in cost per head per year | £38 13 6¾d. |
| Calories per head per day | 3,674 |

Outdoor Relief—

| | | | | | | |
|---|---|---|---|---|---|---|
| Meat (15,457 lbs.) | £386 | 8 | 7 | | | |
| Milk—fresh (10,934 pints) | 138 | 4 | 0 | | | |
| Milk—condensed (9,600 tins) | 165 | 0 | 0 | | | |
| Money grants | 293 | 6 | 4 | | | |
| Printing | 4 | 10 | 6 | £987 | 9 | 5 |
| Salaries | | | | 385 | 0 | 0 |
| Total expenditure on Indoor and Outdoor Relief | | | | £3,499 | 15 | 5 |

---

*Includes washing, cleaning, cooking, coal, charcoal, boot repairs, utensils, ice, medicines, tobacco for inmates, etc., etc.

## INVESTIGATION AND PREVENTION OF OTHER DISEASES

SANDFLIES—

The presence of *Phlebotomus papatasii* is recorded in Gibraltar for the first time. Some specimens of this insect were captured in July in a house in military occupation in the centre of the City and a few others were found later in other houses. Some of the specimens originally taken were sent to England and their identification was confirmed by Dr. Edwards of the Entomological Department of the British Museum.

These are minute and very "hairy" greyish flies about 2 millimetres in length with comparatively long, straggling legs and short pointed wings which are normally held erectly upwards. It is especially characteristic that when disturbed, which they very easily are, they move rapidly and suddenly by short flights to one side or the other, appearing almost to hop like a flea, so that they are very difficult to catch or kill. Their bite is particularly irritating. They breed in dark damp places, such as cracks in soil or masonry, and always in the presence of moist organic matter. These flies dislike daylight or bright lights and emerge to feed as a rule only in the dusk or at night when, however, they may be attracted by not-too-bright artificial light. In most species the female only sucks blood.

Various species of these flies are common along the whole of southern Europe, in north and east Africa, in Iraq and in parts of northern India. They have previously been reported in Spain but never in Gibraltar. Their importance from the medical point of view is due to the fact that some of them are more than suspected of being the "carriers" of the infections of the disease kala azar and of oriental, or tropical, sores; and that this species in particular is known to carry the infection of sandfly fever. So far as can be ascertained this short but sharp febrile disease has not been known in Gibraltar up to date; it is, however, of definite interest that last year the City Analyst in his report recorded the discovery of an infection allied to the human disease kala azar, mentioned above, amongst the hounds of the Royal Calpe Hunt.

In the few places where these flies were found energetic spraying with an insecticide was carried out. The other main measures to be taken are such as obliterate the dark, damp cracks in walls and the ground in which they breed; attention to plastering and the regular whitewashing of internal walls; the proper pointing of external walls; the routine and thorough cleansing of gullies, drains and open or paved yards.

Whether this year's discovery is that of a chance and temporary invasion of no permanent significance remains to be seen. At any rate it would seem to be clear that up till now these flies have, for some reason or other, not found Gibraltar altogether to their liking—and it is fortunate that this has been so for, apart from their potentialities as the "carriers" of disease, they are most perniciously irritating insects.

MOSQUITOES—

There is nothing new to report of these insects. The three species known to be common in Gibraltar remain the only ones so far identified. Though they are not here associated with the transmission of disease it should be remembered that one of them—*Aëdes (stegomyia) argenteus*, the tiger mosquito—is capable of carrying the infection of Yellow Fever, which has in the past decimated the Colony, and of Dengue. This small silver and black mosquito appeared first at the beginning of July and continued up to the winter months. It is worth noting that not only does this species bite freely by day as well as by night, but it prefers to breed in very close association with those on whom it feeds, so that a complaint of being worried by it is as a rule easily rectified by a search in and next to the house wherein the complaint originates.

The Table following records the work carried out during the year by the Inspectors, two men permanently employed on these special duties and the six additional men who were employed between 1st June and 31st October.

A short note on one of the habits of local mosquito larvae is printed at the end of this Report, by permission of the Editors of the Journal of the Royal Army Medical Corps in which it was originally published.

# MOSQUITO CAMPAIGN RETURN FOR 1935

| Week ending | Visits paid to Premises | Town—Lower | | | | Town—Middle | | | | Town—Upper | | | | South | | | | North | | | | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tubs | Barrels | Earthenware Vessels | Others | Tubs | Barrels | Earthenware Vessels | Others | Tubs | Barrels | Earthenware Vessels | Others | Tubs | Barrels | Earthenware Vessels | Others | Tubs | Barrels | Earthenware Vessels | Others | |
| Jan 5 | 284 | ... | ... | | ... | ... | | ... | ... | ... | | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| 12 | 323 | ... | ... | | ... | ... | ... | ... | 1 | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 19 | 335 | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 2 |
| 26 | 355 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| Feb 2 | 336 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 9 | 362 | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | 3 |
| 16 | 346 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 23 | 342 | ... | | | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| Mar. 2 | 348 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 9 | 363 | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| 16 | 341 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 23 | 323 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | ... | ... | ... | ... |
| 30 | 329 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| April 6 | 354 | ... | ... | ... | ... | ... | ... | ... | | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 13 | 332 | ... | ... | | ... | ... | ... | ... | | ... | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... |
| 20 | 326 | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | | ... | ... | 1 |
| 27 | 380 | ... | ... | ... | 4 | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1 | | ... | ... | ... | 5 |
| May 4 | 355 | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | | ... | ... | 2 | ... | ... | ... | ... | 2 |
| 11 | 353 | ... | | ... | ... | ... | | ... | ... | ... | | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 18 | 358 | ... | | ... | ... | ... | ... | ... | ... | 2 | ... | | 2 | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| 25 | 344 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 1 | ... | | ... | ... | 2 | ... | ... | ... | ... | 6 |
| June 1 | 384 | | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | 7 | ... | ... | ... | | 10 |
| 8 | 357 | ... | ... | ... | 3 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | 7 | ... | ... | ... | ... | 12 |
| 15 | 347 | | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | ... | 5 |
| 22 | 887 | ... | ... | ... | ... | 8 | ... | ... | ... | 6 | ... | ... | ... | ... | 1 | ... | 6 | 2 | ... | ... | ... | 23 |
| 29 | 769 | ... | | ... | ... | 1 | 1 | 1 | 1 | 6 | ... | ... | ... | ... | 1 | ... | 1 | ... | | ... | 1 | 13 |
| July 6 | 752 | ... | 2 | ... | ... | 4 | ... | 1 | ... | 3 | ... | ... | ... | ... | ... | ... | 4 | 2 | ... | ... | ... | 16 |
| 13 | 819 | 1 | ... | ... | 3 | 2 | 1 | ... | 1 | 4 | ... | ... | ... | ... | ... | ... | 3 | 1 | ... | ... | ... | 16 |
| 20 | 811 | ... | ... | | ... | 4 | ... | 1 | ... | 5 | 1 | ... | ... | ... | ... | 1 | 1 | ... | | ... | 2 | 15 |
| 27 | 856 | ... | ... | ... | ... | 1 | ... | ... | 2 | 3 | ... | ... | ... | ... | ... | ... | 1 | 1 | 1 | ... | 8 | 17 |
| Aug. 3 | 860 | 1 | ... | ... | ... | 4 | ... | 1 | 1 | 4 | ... | 1 | ... | ... | ... | ... | | ... | ... | ... | 2 | 14 |
| 10 | 862 | ... | ... | ... | ... | 3 | ... | 4 | 1 | 2 | ... | 1 | ... | | ... | ... | ... | ... | 2 | ... | 2 | 15 |
| 17 | 849 | 1 | ... | ... | ... | 2 | ... | 1 | ... | 5 | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | 1 | 13 |
| 24 | 851 | | ... | ... | 3 | 4 | ... | | ... | 3 | ... | 1 | ... | ... | ... | ... | 2 | ... | ... | ... | 7 | 20 |
| 31 | 854 | ... | ... | ... | ... | ... | ... | 1 | 2 | 3 | ... | ... | ... | ... | ... | | 3 | | ... | ... | ... | 9 |
| Sept. 7 | 859 | 1 | ... | ... | | 1 | | 1 | 1 | 3 | ... | ... | ... | ... | 1 | ... | 2 | ... | ... | ... | 1 | 11 |
| 14 | 848 | ... | ... | ... | 1 | 2 | ... | 1 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 8 |
| 21 | 845 | ... | ... | 1 | ... | 1 | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 7 |
| 28 | 849 | 1 | ... | ... | | 3 | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | 7 |
| Oct. 5 | 846 | 1 | ... | 1 | | 3 | | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | 9 |
| 12 | 838 | ... | ... | ... | 2 | 2 | | ... | ... | 6 | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | ... | 14 |
| 19 | 812 | ... | ... | 1 | | ... | ... | 2 | ... | 2 | | ... | ... | ... | ... | ... | 3 | ... | ... | ... | 1 | 9 |
| 26 | 852 | ... | ... | ... | ... | 1 | ... | 1 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| Nov. 2 | 617 | ... | ... | | 1 | | | 1 | | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | 5 |
| 9 | 380 | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| 16 | 433 | ... | ... | ... | ... | ... | ... | ... | | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 2 |
| 23 | 403 | ... | ... | | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| 30 | 415 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| Dec. 7 | 431 | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 14 | 426 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 21 | 420 | ... | ... | ... | ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 31 | 420 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Totals ...... | 28,141 | 6 | 2 | 3 | 19 | 46 | 2 | 18 | 11 | 69 | 4 | 5 | 4 | ... | 5 | 1 | 74 | 7 | 3 | ... | 28 | 307 |

Others include—Pits, drinking troughs, washing troughs, catchpits, wells, gullies, fresh water tanks, fire-buckets, galvanized iron baths old tins, flower pots, vases, bottles, grindstone receptacles, flushing tanks, under-ground tanks, wash-boilers, &c. &c., &c.

## SUMMARY.

| | | | |
|---|---|---|---|
| Tubs ... ... ... ... ... | 128 | 1st Offences ... ... ... ... | 220 |
| Barrels ... ... ... ... ... | 16 | 2nd ,, ... ... ... | 6 |
| Earthenware Vessels ... ... | 27 | 3rd ,, ... ... ... ... ... | 1 |
| Others ... ... ... ... | 136 | 4th ,, ... ... ... ... | 1 |
| Total ... ... ... | 307 | | |

### FLIES—

The measures hitherto in force have been continued with reasonable success. It remains difficult, and I suppose always will do so, to persuade those who possess gardens that the collection of manure, and even digging it in, during the warm months is bound to be associated with a large increase of the fly population. In this connection plans have been made for the erection of special manure stands (Baber's pattern) for the use of the Alameda Gardens next year to try to prevent fly breeding and still allow the gardeners the supplies which are essential for the continuance and increase of the amenities which these gardens provide.

### RATS—

The following Tables record the activities of the perpetual campaign against rats. It is pleasing to be able to record that the catches of the two men employed by the Council on this work show a very marked increase in comparison with recent years.

Of the rats caught which are periodically submitted to examination in the City Laboratories, none were found infected with plague.

## Rats destroyed during 1935, by Districts (not including H.M. Dockyard).

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Town District ............ | 198 | 162 | 178 | 180 | 262 | 270 | 301 | 320 | 296 | 276 | 256 | 253 | 2,952 |
| South ,, ............ | 180 | 154 | 184 | 174 | 232 | 271 | 274 | 316 | 294 | 306 | 283 | 305 | 2,973 |
| North ,, ............ | 34 | 49 | 37 | 37 | 31 | 46 | 49 | 79 | 41 | 82 | 71 | 52 | 608 |
| Sheds and Warehouses Waterport Wharf and Commercial Mole ...... | 10 | 5 | 15 | 6 | 7 | 5 | 11 | 18 | 21 | 15 | 9 | 6 | 128 |
| Total............... | 422 | 370 | 414 | 397 | 532 | 592 | 635 | 733 | 652 | 679 | 619 | 616 | 6,661 |

## Rats examined at City Laboratories during 1935.

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Infected ......... | 11 | 3 | 6 | 7 | 11 | 6 | 16 | 13 | 10 | 8 | 3 | 10 | 104 |
| Infected .................... | — | — | — | — | — | — | — | — | — | — | — | — | Nil |

## Number of poisoned baits laid by Rat Catchers during 1935.

| Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3,538 | 2,662 | 3,223 | 3,537 | 3,547 | 2,678 | 2,681 | 3,457 | 3,375 | 3,733 | 3,194 | 3,283 | 38,908 |

## Total number of Rats destroyed during 1935.

| | | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept | Oct. | Nov. | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Civil and Colonial Property | Trapped ... | 422 | 369 | 413 | 396 | 532 | 590 | 634 | 732 | 651 | 677 | 618 | 616 | 6,650 |
| | Poisoned... | — | 1 | 1 | 1 | — | 2 | 1 | 1 | 1 | 2 | 1 | — | 11 |
| H.M. Dockyard | Trapped ... | 99 | 78 | 108 | 87 | 90 | 93 | 85 | 56 | 49 | 65 | 94 | 83 | 987 |
| | Poisoned... | 25 | 31 | 15 | 21 | 16 | 14 | 20 | 9 | 7 | 4 | 3 | 5 | 170 |
| Total.............. | | 546 | 479 | 537 | 505 | 638 | 699 | 740 | 798 | 708 | 748 | 716 | 704 | 7,818 |

## MEDICAL WORK FOR THE COUNCIL

The following numbers of workmen have been examined prior to their employment in the various departments of the Council:—

| | |
|---|---|
| January | 10 |
| February | 8 |
| March | 1 |
| April | 7 |
| May | 6 |
| June | 19 |
| July | 5 |
| August | — |
| September | 1 |
| October | 1 |
| November | 3 |
| December | 3 |
| Total | 64 |

## SERA, VACCINES, &c., KEPT IN STOCK

Stocks of the following sera and vaccines are kept in stock for issue to the hospital and to medical practitioners:—

Anti-Streptococcus Serum
Anti-Anthrax Serum
Anti-Meningococcus Serum
Anti-Dysentery Serum
Diphtheria antitoxin
Anti-Plague Serum
Tetanus Antitoxin
Cholera Vaccine
Anti-Plague Vaccine
Compound Catarrhal Vaccine
Anti-Rabic vaccine
Scarlet Fever Streptococcus Antitoxin
Calf lymph
Tuberculin (veterinary uses)

During the year an electric refrigerator has been purchased and installed in the Laboratory for the storing of these sera and vaccines so that they are now kept under the best conditions for retaining their potency for the full period of storage. This method of storage does not interfere with their immediate availability for issue on demand. The refrigerator is also of considerable use in the work of the laboratory for the storage, under conditions in which keeping quality is assured, of certain essential media, sera and reagents.

It will be noticed that an addition to the list above is anti-rabic vaccine. By the very helpful co-operation of the Director of the Pasteur Institute of Morocco a constantly renewed supply of this vaccine is now maintained here, so that, if necessary, complete anti-rabic treatment can be carried out in Gibraltar without the delay or expense of the patient travelling to Tangier, as was necessary previously. In addition to the stock maintained here, sufficient to meet ordinary possible requirements, further supplies are at once available from the Pasteur Institute to deal with any emergency which may arise.

## DISINFECTION

The following Table shews in detail the articles disinfected during the year :—

| Month | Beds and Mattresses. | Bolsters and Pillows | Blankets and Quilts. | Sheets | Counterpanes. | Miscellaneous. | Totals. |
|---|---|---|---|---|---|---|---|
| January | 66 | 41 | 38 | 56 | — | 162 | 363 |
| February | 107 | 57 | 59 | 31 | 5 | 88 | 347 |
| March | 68 | 36 | 35 | 40 | 1 | 103 | 283 |
| April | 32 | 12 | 11 | 10 | — | 62 | 127 |
| May | 31 | 15 | 26 | 17 | — | 43 | 132 |
| June | 27 | 35 | 54 | 44 | — | 112 | 272 |
| July | 65 | 73 | 93 | 56 | — | 126 | 413 |
| August | 111 | 146 | 92 | 121 | — | 280 | 750 |
| September | 87 | 52 | 29 | 30 |  | 59 | 257 |
| October | 151 | 110 | 95 | 42 | 2 | 133 | 533 |
| November | 60 | 29 | 25 | 20 | — | 21 | 155 |
| December | 54 | 41 | 35 | 30 | 4 | 83 | 247 |
| Totals | 859 | 647 | 592 | 497 | 12 | 1,272 | 3,379 |

In addition 196 premises were disinfected on account of infectious disease, and 14 for the destruction of vermin.

All stables were disinfected weekly during the summer months for the prevention of fly breeding.

## AMBULANCE SERVICE

The following cases were conveyed by ambulance during the year. On one occasion, by special permission, an ambulance was sent to bring an inhabitant to the Colonial Hospital who had been seriously injured in a motor car accident near Cadiz.

| | Local Cases | Bay Cases |
|---|---|---|
| Pulmonary Tuberculosis | 2 | 1 |
| Diphtheria | 3 | 1 |
| Pneumonia | 3 | 7 |
| Scarlet Fever | 2 | 3 |
| Enteric Fever | 6 | 3 |
| Erysipelas | 3 | — |
| Appendicitis | 2 | 4 |
| Small Pox | — | 1 |
| Street accidents | 44 | — |
| Miscellaneous | 98 | 47 |
| Total | 163 | 67 |

# SANITARY CIRCUMSTANCES OF THE DISTRICT

This section of the Report has been written in collaboration with Mr. W. H. Pearce, M.Inst.C.E., F.S.I., M.Inst.W.E., City and Water Engineer, whose notes and knowledge are fully quoted in the following paragraphs.

## Water Supply—

### (a) Drinking Water.

The year is notable for the development of the fresh water wells, known as No. 8 and No. 9, at North Front.

The deficiency of the year's rainfall has already been noted in the opening paragraphs of this Report. At the same time there was a marked rise in the demand for potable water, a demand which has doubled itself in the past ten years. That this demand has been successfully met, with, in addition, a surplus available for sale to the shipping, is due to the discovery and development of these new wells. I cannot do less than impress the fact that this work of the City Engineer averted what might have been a serious water famine at the end of the hot weather. Such a shortage in the crowded city of Gibraltar must have been attended not only by intense personal discomfort but also by outbreaks of disease. In fact, some seven million gallons of potable water were supplied from these wells, and, in contra–distinction to many neighbouring towns, the population of Gibraltar suffered no inconvenience or shortage.

Considerable criticism was levelled at the waters of these wells from many quarters when they were first taken into use. It was, in fact, openly hinted that their contents were derived from underground sources in the Rock via the cemetery—a manifestly undersirable source of a city's drinking water supply—and many complaints were received in the Public Health Department impugning the quality and purity of the supply. These complaints varied from the alleged unsuitability of the water for use in ship's boilers to the impossibility of retaining it in the human stomach even when mixed with an equal or greater quantity of gin. The matter is, therefore, of some considerable importance.

The wells are situated close to the centre of the boundary fence of the Neutral Ground at North Front, and are, approximately, 430 yards from the northern limit of the cemetery. They possess several features of particular interest and importance when one tries to determine the origin of the water which they contain.

No. 8 well was sunk in March 1934, through the sandy soil in an open timbered shaft: the surface water encountered was pumped out as the digging proceeded, and at a dozen feet below the surface was controlled at the rate of about 3,000 gallons an hour. At about thirteen feet from the surface an inclined layer of hard sandstone about one foot thick was encountered. A hole some fifteen inches square was pierced in this layer when water immediately surged up through the hole under pressure and attained a rest level about three feet above the sandstone. Underneath this sandstone layer there is a space containing running sand and water; this rests on a hard, stony layer which is sufficiently solid to require the use of a sledge hammer to drive a pointed steel bar into it. This lower layer was not investigated as it was feared that to chip much out of it would be to risk breaking through and so losing the water which flows on top of it. This water was noted to be flowing horizontally under the sandstone bed and in a direction from the north west. At this stage, and for the rest of the operation of fixing the well, pumping at the rate of 10,000 gallons an hour kept the water level down only sufficiently to allow of work being carried on, but did not keep the area of work dry or even comparatively clear. In other words, upwards of 7,000 gallons of water an hour were entering the well additional to the surface water already encountered.

The well was then completed by building a level base on top of the sandstone layer with concrete blocks set in cement mortar. As the inflow of water was not completely controlled by pumping it is not absolutely certain that this junction is so satisfactorily watertight as entirely to exclude the surface water. Upon these blocks a mild steel cylinder was set and fixed, and a good joint obtained.

During the whole of the drought period of last summer (1935), after a winter of very deficient rainfall, the water level in this well stood at 3.22 feet below ordnance datum, or some 3 feet above the sandstone layer. Pumping at this time from wells No. 8 and No. 9 together, taking equal quantities simultaneously from both, at a combined rate of 6,000 gallons an hour, and for periods up to 56 hours continuously, caused a constant drop in the water level of 1 foot 9 inches to 2 feet 3 inches: recovery to normal rest level of the water occurred within ten minutes of cessation of pumping.

With the knowledge gained at the construction of No. 8, several points of difference were planned in the sinking of No. 9 with the object of completely protecting the well from the entry of surface water.

No. 9 well is situated 70 yards distant to the south-east of No. 8 and was constructed in the spring of 1935, i.e., about a year later.

Interlocking steel piling was driven into the sandy soil for some fourteen and a half feet until a hard layer of conglomerate of coarse grit and minute set shells was met. This layer is about one foot thick and is entirely different from, and considerably softer than, the hard upper sandstone layer in No. 8. When this layer was broken through a space some eighteen inches deep was disclosed containing running sand and water; this water welled up to several feet head above the conglomerate layer. Below the sand and water there is again, a solid, hard, stony layer. A clean hole was cut in the conglomerate and a steel shell, three and a half feet in diameter with cutting edges was lowered through and sunk, by weighting, a few inches into the deep or hard layer. The bottom eighteen inches of this shell are perforated where it rests in the sand, and it is surrounded by rock and stone therein for support and filtration. Above the conglomerate layer the space between the outer shell of interlocked steel piling and the inner shell lowered into the water bearing sand is packed solid with concrete to exclude surface water. The water in this well rises and rests a few inches higher than in well No. 8—i.e., at 2.42 feet below ordnance datum during the summer and autumn of 1935. In this well also it was noted that the flow of water comes from the north west. Here, too, continuous pumping, as recorded above for No. 8, dropped the water level less than two feet, and recovery to rest level on cessation of pumping was almost immediate. A special test pumping from this well alone, in May 1935, at the rate of 10,000 gallons an hour pulled the water level down 24 inches where it remained stationary until pumping ceased, when recovery to normal rest level took place within ten minutes.

When No. 8 well was opened, though every effort had been made to exclude surface water, the possibility of its entrance into the well still existed; it was realised also that though the appearance of the water flowing from the north west was suggestive, it was no guarantee of the source. On the advice of my predecessor (Major G. D. Jameson, R.A.M.C.) an automatic chloraminating plant was installed in the pumping station, so that the water passed to the reservoirs is rendered bacteriologically satisfactory on its way. The rate of working of this plant is controlled by frequent tests with the result that, whilst the water is maintained at a satisfactory state of purity, neither smell nor taste is present when it is issued for consumption.

In our search for the origin of this water we are able to turn to other wells in the immediate neighbourhood. In a parallel line just over thirty yards to the south west (or the Gibraltar and cemetery side) of the line of Nos. 8 & 9, there are three brackish water wells, known as Nos. 1, 2 & 3: their relative positions are shewn in the diagram on page 38. These wells are sunk through the soil to a depth of some twenty feet from the surface, and are reinforced by bore tubes driven from their floors to pass through an "impermeable" stratum some ten feet lower. The bore tubes bring up frankly brackish water exceeding half the saline content of sea water. The remaining water in these wells is surface water plain and simple, for none of them pass through hard strata such as are encountered in the cases of No. 8 & 9. The resulting mixed water is the so-called "sanitary water," which is used for general purposes other than consumption, and which varies in salinity, according to the quantity of surface water available at different seasons, from some 400 to 1,300 parts of chlorine per 100,000. The rest level of the water in these brackish wells is slightly less than one inch below ordnance datum—that is to say, just over three and just under two and a half feet higher than the water rest levels in wells Nos. 8 & 9 respectively. These figures refer to the summer and autumn of 1935. From one point of view the greater height of the water level in Nos. 1, 2 & 3 is an argument against the entry of surface water into Nos. 8 & 9 : though, of course, some of this additional height may be due to pressure through the bore tubes of the lower level saline water. At the same time, in another well, No. 7, which does not otherwise enter into this discussion, except that it is in the same neighbourhood and is of the same construction as the brackish wells but has no bore tubes from its floor—i.e., it contains solely surface water—in this well during March and April 1935, the rest level of the water was just less than one and a half feet below ordnance datum, or one foot and eighteen inches above that of Nos. 8 and 9 respectively. In other words, there is reason to think that the rest level of plain surface water at that season was very definitely above the levels maintained in the new wells; and the fact that these latter levels were constantly low suggests that surface water did not enter them.

When water is pumped from a shallow or surface well which derives its supply from the subsoil water, what is known as a "cone of depression" is formed—an inverted cone, with its apex at the bottom of the well, extending over an area as great as 100 to 160 times the depression of the water caused by pumping from the well; over this area the subsoil water is drawn into the well. It is recorded above that pumping from wells Nos. 8 & 9 may reduce their water level some two feet. This gives their minimal cones of depression, if they are drawing surface water, as some seventy yards, and their maximal, which, owing to the relatively high rates and prolonged periods of pumping employed and the highly porous nature of the soft sandy soil, might well be attained, as up to one hundred yards and more. These distances, even the lesser of them, will be seen on reference to the diagram, not only to bring Nos. 8 & 9 into each other's cones of depression but also to place them in similar relation to Nos. 1, 2 & 3. Prolonged pumping from Nos. 1, 2 & 3 independently demonstrates this in relation to each other

—i.e., pumping from No. 1 well in time draws down the water level in No. 2 and so on. But neither pumping singly from No. 1, 2 or 3, nor combined pumping from all three together at high rates (up to 45,000 gallons per hour) for long periods has yet affected the water levels in Nos. 8 & 9 to the slightest degree.

Prolonged pumping from either No. 8 or No. 9 independently has not affected the water level of the other; nor has combined or independent pumping from them affected the levels in Nos. 1, 2 or 3. These facts suggest, in the first place, that Nos. 8 and 9 do not draw their main supply from local surface water, but from a more distant source; and, in the second place demonstrate that, so far as can possibly be proved at present, there is no flow of surface water into Nos. 8 & 9 from the south or Gibraltar side in this particular area. Further evidence in this direction is supplied by the fact that, after the commencement of the winter rains, movement of the levels in the brackish water wells was noted early, but did not appear in Nos. 8 and 9 till some two months later.

The quality of this water is fully discussed in the report of the City Analyst which follows. The water is naturally of much greater mineral content than the stored rain water to which all inhabitants of Gibraltar are accustomed; it contains some 44 grains of mineral salts per gallon, has about 17 degrees of temporary and 7 of permanent hardness: it is clear, bright and sparkling and of agreeable taste: its bacteriological purity, though generally of a statisfactory standard, is additionally safeguarded by treatment with ammonia and chlorine.

I do not profess to discuss in any way the theories put forward by the City Analyst regarding the nature and origin of these waters. I have above recorded a series of facts, and tried to draw a few outstanding conclusions from them, sufficient to justify the continued use of these very valuable sources of supply; but I do consider it essential that no reasonable and reasoned theory should at present be set aside by mere argument, and that all investigations possible should be continued over a series of years, so that in time we may collect sufficient data to allow us to make certain statements regarding the water in these wells.

The City Engineer further reports as follows:—

"The consumption of potable water is increasing rapidly and it appears that, more and more, Gibraltar will be dependent on the additional supply from the new wells.

The consumption of over 19 million gallons in 1935, marks an increase of nearly 100 per cent. in the last ten years.

The potable water situation is now probably better than it has ever been, and the new source is fortuitously situated within the Fortress area and far less vulnerable to attack or damage than rain water catchment areas.

During the year under review the rock excavation and tunnelling was successfully completed for the construction of Reservoir No. 8, of one million gallons nominal capacity.

The reconstruction of the artificial catchment areas at the east side was again pressed forward during the available dry months and overtime was worked in a race against the depredations of the white ant which have made the areas insecure. This work will be resumed as soon as the rains cease and the total cost will scarcely be less than £15,000.

Pressed steel piles have been made and about 1,000 will be tried this coming summer.

Last summer a few compressed cork piles were put in and it will be interesting to see if this material will be left alone by the termites.

The corrugated iron sheets were found in such wasted condition as to need replacement. Their life in the sea air is about 25 years.

Since the last report, pumping arrangements have been made and water from Nos. 8 and 9 wells is pumped up to the High Level Reservoirs for distribution to the town and shipping.

The levels in the new wells did not show much variation in the late summer months, but as a precautionary measure pumping was spread over periods to minimise the risk of an increase of salinity as the water levels are well below the very adjacent sea levels.''

(b) Brackish Water.

''This water is supplied for general purposes other than potable and is obtained from wells originally sunk in the surface sands of North Front.

The quantity of water pumped now amounts to over 309 million gallons per year, and a falling off in the yield is apparent.

Bore tubes have been driven in the bottom of the Brackish Water dug wells, and by tapping through an impervious stratum situated about 32 feet from the surface an additional, but more saline, supply has been obtained.

It is thought that the finding of more brackish water will be necessary before long to maintain the large supply required.

Gibraltar has a difficult and expensive distribution system of different pressure zones. Cast iron pipes, galvanized iron pipes and all water fittings rapidly deteriorate with brackish water, and drain pipes encrust internally.

Within the last few years about 75 per cent. of the pumping machinery in the three principal stations has been renewed on modern lines.

It is found that certain working parts of water meters are more resistant to corrosion by brackish water when made in ebonite.

The Calpe High Level Reservoir contains only about 150,000 gallons of brackish water and is considered small for sustained fire fighting purposes.''

### SEWERAGE AND DRAINAGE.

''The whole of the sewage eventually finds its way by means of a very large gravitation sewer to the sea at Europa Point.

An area to the north is drained to various ejector chambers and lifted to the head of the before mentioned main outfall sewer.

The main trunk outfall sewer is flat in gradient and at high tide silt is deposited, but not so persistently or not in such large quantities as hitherto, for the construction of catchpits and the tarring of hill roads has effected great improvement and saved much money previously spent on the dangerous work of silt removal from the main sewer.

Sewage entering at the north end of the south-flowing main sewer is much broken down before it reaches discharge or outfall point.

It is not a simple matter to get storm water away with the rainfall intensities and steep gradients obtaining.

A recent purchase of a Dennis Gulley Emptying Machine has proved a success and effected a real sanitary improvement in the hot summer months. Road gulleys are still receptacles for things which should not be put there.''

### REFUSE COLLECTION AND DISPOSAL.

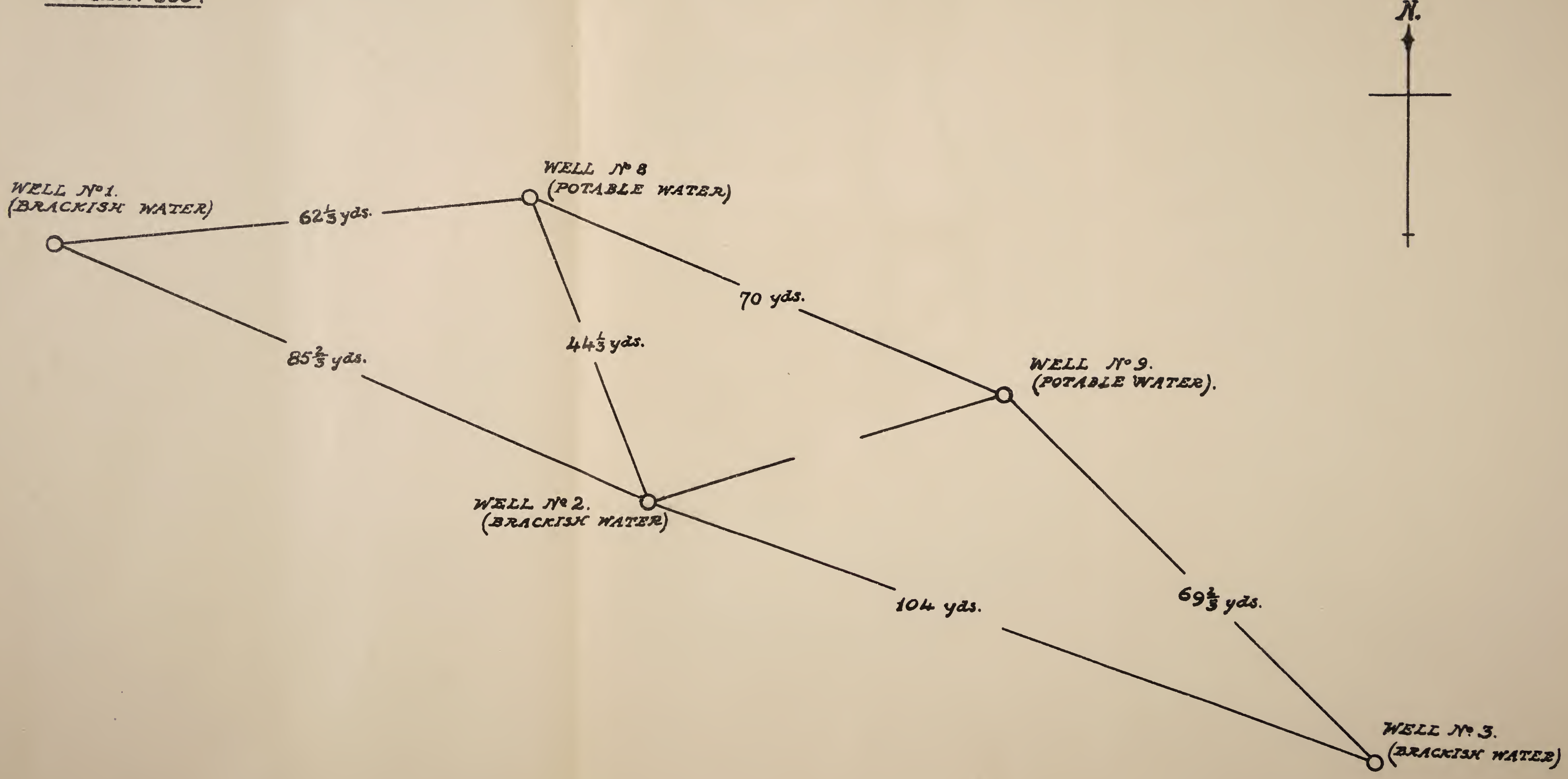
"House refuse is collected once daily in winter and twice daily in summer and is incinerated in a duplicate twin-cell Destructor at North Front."

### PUBLIC HIGHWAYS.

''Considerable damage to many of the roads has resulted during the year from the relaying of gas, electric and water mains. These roads are of old construction and were not built for heavy and fast moving motor traffic: their foundations are

## LOCATION PLAN SHOWING POSITION OF WELLS Nos. 1, 2, 3, 8 & 9.

SCALE: $\frac{1}{600}$.



shallow and continued retrenching has not improved their condition. It is becoming evident that complete reconstruction with heavy foundations will soon have to be faced.''

### HOUSING.

Two Crown Properties have been reconditioned. Private enterprise continues busy in the remodelling of tenement houses, and it is pleasing to note that a considerable number of small tenements have been under construction to the great improvement from all points of view of the property concerned. The construction of a small block of tenements by the Government is provided for in the Estimates for 1936. This is an advance; but I am bound to record that it isnot a policy. We have not here the powers of condemnation or clearing out of congested and slum-type houses, such as obtain, for instance, in England; so that the Public Health Department has, at present, to watch, more or less patiently, the development of private enterprise; unable really to guide it, and unable to do more than require repair of the worst buildings, in the hope, often in vain, that these works will not result in such raising of rents as will leave the working classes worse off than before.

The mere construction of new buildings can only result in increasing the population of the Colony by providing increased opportunity for immigration; but it does, and can do, nothing to improve the conditions of the overcrowded slum of population.

It appears to me that it still has to be recognised here that the housing of the working classes under proper hygienic conditions, at rents which they can reasonably afford, is not a paying commercial proposition. The Government housing systems which are now in force in England are witness to acceptance of this fact. A difficulty here, which does not exist elsewhere, is the almost absolute impossibility of housing those persons who would be displaced by a reconstruction scheme of any effective magnitude; but there do not seem to me to be any insuperable difficulties in the tackling of the problem piecemeal—except the initial one of starting such a continuous policy.

## SUMMARY OF WORK DONE BY SANITARY INSPECTORS DURING 1935

| | |
|---|---|
| Complaints received | 353 |
| Premises inspected— | |
| General inspection | 3 |
| Casual inspection | 26 |
| Nuisances found— | |
| Defective drains | 121 |
| Obstructed drains | 288 |
| Defective water closets | 240 |
| ,, water closet fittings | 311 |
| ,, water fittings | 269 |
| ,, rainwater pipes | 76 |
| ,, eavesgutters | 91 |
| ,, roofs | 47 |
| ,, yard paving | 49 |
| Dampness | 38 |
| Premises dirty | 118 |
| Defective or no refuse bin | 199 |
| Other minor nuisances | 1385 |
| Suspected pollution of water in underground tank | 32 |
| Underground tank not insect proof | 20 |
| Brackish water tank not insect proof | 35 |
| Brackish water running to waste | 218 |
| Miscellaneous services— | |
| Samples of Food and Drugs taken for analysis | 112 |
| Premises disinfected for infectious disease | 196 |
| Premises disinfected for vermin, etc. | 14 |
| Stables disinfected | 643 |
| Articles disinfected at North Front Disinfecting Station | 3879 |
| Visits of enquiry re infectious disease | 187 |
| Visits paid to Milk shops | 230 |
| ,, ,, ,, Eating houses | 303 |
| ,, ,, ,, Mineral water factories | 264 |
| ,, ,, ,, Common Lodging houses | 4 |
| ,, ,, ,, premises on which notice for abatement of nuisance has been served and are re-visited for the purpose of ascertaining if requirements have been complied with | 1771 |

Cases removed in Ambulances—

| | |
|---|---|
| Local | 163 |
| Bay, etc. | 67 |
| Notices served in accordance with the Vaccination Ordinance, 1887 | 418 |
| Legal proceedings instituted | 7 |

## COMMON LODGING HOUSES

There is only one common lodging house in Gibraltar at present.

Routine inspection shewed conditions to be, on the whole, satisfactory, and no case of infectious disease occurred in it during the year.

# FOOD

In no instance was legal action necessary in respect of the exposure of unsound food for sale. The following articles were destroyed as unfit for consumption at the request of their owners :—

| | |
|---|---|
| Herrings | 103 cases. |
| Sausages | 46 cases. |
| Eggs | 164 crates.<br>(118,080 in No.) |
| Carrots | 140 bags. |
| Codfish | 5 bales. |
| Ham | 7 tins. |
| Sausage (Italian) | 9½ lbs. |
| Preserved Fruits | 9 tins. |

Reports on samples taken for analysis are included in the Report of the City Analyst.

Market produce has been plentiful and, on the whole, of good quality throughout the year.

### MILK SUPPLY—

The milk supply is, as has been described previously, partly local but mostly imported. The average daily sale of milk was reported to be :—

| | Cows' | Goats' |
|---|---|---|
| Imported | 366 pints | 5,780 pints |
| Local | 832 ,, | 120 ,, |

and, in addition, some 2,500 tons of condensed milk are sold in Gibraltar daily.

A scheme of wholesale improvement of the accommodation of a private local dairy farm at North Front has been started. It is hoped that before this report is in print the premises of this concern will have been reconstructed completely on hygienic lines.

### ICE CREAMS—

As is recorded in the report of the City Analyst, an investigation into the composition of ice creams revealed that in many cases the public had been getting little, if any, true food value for their expenditure on these products. Ice creams properly made of pure dairy products can be highly nutritious. A few countries have laid down legal standards, but this has not yet been done in England. Sale of ice creams in the streets has not been permitted, and in the absence of any legal standard for the protection of the public I am loath to recommend its re-introduction. The matter is still under careful consideration.

MARKETS AND SLAUGHTERHOUSES—

The Public Markets and the Slaughterhouse have been maintained in good condition.

During the year an additional weighing machine has been purchased both as a reserve for use in the event of break-down of the original apparatus, and as a check in the case of queries: it has already proved its value. A portable weighing dial was also purchased which has been most useful both at the Markets and the Slaughterhouse.

While the number of animals slaughtered for food continues to decrease, the imports of frozen meat show a steady rise.

Condemnations of whole or part carcases have increased in comparison with last year, but when compared with preceding years a very marked improvement has been noted in imported Moorish cattle as regards infection with *Cysticercus bovis* (the 'larval' form of the beef tapeworm). A marked decrease is also recorded of tuberculosis in pigs.

Foot and mouth disease was diagnosed in a consignment of cattle imported from Tangier at the end of December. The disease was of mild form and called for local condemnation of affected parts only in respect of four beasts up to the end of the year. Thorough precautions were instituted and widespread and repeated disinfections were carried out after disposal of the last of the consignment. The importers of cattle gave their assistance freely; and no recurrence of the infection has been noted up to the time of writing (some three months after the end of the outbreak).

NUMBER OF ANIMALS SLAUGHTERED—

| | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|
| Cattle ......... | 2273 | 1892 | 1512 | 1446 |
| Sheep ......... | 2498 | 1491 | 1278 | 1154 |
| Pigs .......... | 1270 | 786 | 759 | 676 |

POUNDS WEIGHT OF FROZEN MEAT IMPORTED—

| | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|
| Beef .......... | 228,072 | 377,235 | 436,666 | 678,264 |
| Mutton ...... | 116,099 | 156,030 | 181,839 | 178,761 |
| Pork .......... | 37,584 | 61,482 | 92,261 | 128,564 |

The following condemnations of locally slaughtered meat were made during the year :—

CATTLE—

| | In whole | | In part |
|---|---|---|---|
| Cysticercus bovis ...................... | 7 | ...... | 26 |
| Tuberculosis .......................... | 13 | ...... | 28 |
| Jaundice ................................ | 2 | ...... | — |
| Fever and Jaundice ................. | 2 | ...... | — |

| | In whole | | In part |
|---|---|---|---|
| Pneumonia and Jaundice | 1 | ...... | — |
| Fever (acute) | 3 | ...... | — |
| Perirenal hæmatoma | — | ...... | 1 |
| Pleurisy | — | ...... | 1 |
| Abscess | — | ...... | 1 |
| Umblical sepsis | — | ...... | 1 |
| Foot and Mouth disease | — | ...... | 4 |
| SHEEP— | | | |
| Emaciation | 7 | ...... | — |
| Pseudo-Tuberculosis | — | ...... | 1 |
| Pleurisy | — | ...... | 1 |
| Fever (acute) | 1 | ...... | — |
| PIGS— | | | |
| Tuberculosis | — | ...... | 16 |
| Septic peritonitis | 2 | ...... | — |
| Septic pleurisy | 2 | ...... | — |
| Dermatitis | — | ...... | 2 |
| Hæmorrhagic lymphadenitis | 1 | ...... | — |
| Erysipelas | — | ...... | 1 |

# AMOUNT OF SHIPPING ENTERING THE PORT OF GIBRALTAR DURING THE YEAR 1935.

| | | Vessels entered in 1935* | Net Tonnage. | Number inspected. | Left in quarantine | Admitted to Pratique. |
|---|---|---|---|---|---|---|
| British | Steam | 1,836 | 5,488,967 | 4 | — | 4 |
| | Sailing | 30 | 3,086 | — | — | — |
| Total British | | 1,866 | 5,492,053 | 4 | — | 4 |
| Foreing | Steam | 2,540 | 6,412,802 | 2 | 1‖ | 1 |
| | Sailing | 2,316 | 58,993 | — | — | — |
| Total Foreign | | 4,856 | 6,471,795 | 2 | 1 | 1 |
| Total British and Foreign | | 6,722 | 11,963,848 | 6 | 1 | 5 |

* Exclusive of men-of-war, yachts and seaplanes.

‖ Landed one case of Small Pox.

# CANNIBALISM AMONGST MOSQUITO LARVAE

by

**Major R. A. Mansell, M.B.E., R.A.M.C.**

"They are extremely active, and though their food consists usually of algæ and vegetable matter, some species are carnivorous and rapacious." Dr. Alcock apparently wrote this of the larvæ of the Culicidæ in general. ("Entomology for Medical Officers," 1930 Edition, page 60). In the list which he gives later of the natural enemies of mosquito larvæ he includes certain predaceous Culicid larvæ, such as Chaoborus, Mochlonyx, Megarrhinus, and others." I have not been able to discover exactly who these others are, but that is doubtless due to the limitation of my ability to search the literature; nor can I remember actually having read anything more detailed than the words just quoted—there are only too obvious limitations here also. However, even if it be as old as the hills amongst recorded observations, what follows interested me sufficiently to make me late for lunch, and several other things, and enabled me to bear the subsequent recriminations with that outward fortitude and calm which is sustained by an inward satisfaction. Whether the reader will feel the same about it, if this attracts his attention for long enough to delay him, is quite another matter. Anyway, it happened in June, 1935, at Gibraltar.

By some chance what appeared to be undue movement in a bottleful of mosquito larvæ attracted my attention for more than a passing glance. Culicine larvæ and pupæ of all ages were in the bottle, some of the latter, I knew, about ripe for hatching; so I looked a little closer in case I might just see that rather attractive phenomenon—the birth of an adult mosquito. It rapidly became clear, however, that the cause of the excitement was a large larva of the fourth instar which appeared to be definitely attacking its smaller companions. How long it had been at this I do not know; but, within a couple of minutes of my commencing to watch, it had seized a small larva by the back of the neck—that is, more accurately, by the front of the thorax on the right side immediately behind the head. By comparison with other larvæ of the same size and appearance in this bottle I should say that the victim was a second instar of *Culex pipiens*. The assailant, similarly, was a *Theobaldia longiareolata*. This finally successful attack was made in mid-water at the end of what appeared to be a definite, though short, chase of a selected individual.

Having secured its victim the cannibal then resorted to the surface where, hanging by its syphon, it proceeded calmly and quietly to chew through the other's thorax. The mild struggles of the victim appeared to cause little or no inconvenience to its captor, who was about twice its length and proportionately broad. These struggles ceased when the chewing had progressed some third of the way through the breadth of the thorax. In ten minutes the nibbling had gone through the whole breadth of the thorax and the head dropped off and sank. With a few wriggles, while still at the surface, the cannibal got the remainder of the corpse round so that it was in a position to eat straight down the length of the thorax and abdomen : this it then proceeded to do. A certain amount of jostling by other occupants of the jar at times drove the feeder from its position, and it wriggled itself to and from the surface and the bottom of the jar without ceasing its feed or, apparently, being incommodâted in the slightest.

At the end of twenty more minutes, eating at a prodigious pace, the feeder had got down to the seventh segment of its meal. It was then obviously not only full but over full, and its jaws stopped working. For a couple of minutes it made violent efforts at the surface to shake off the unconsumed portion without success. It then dived to the bottom, and for seven whole minutes by the clock it stayed either at the bottom rubbing its head with the protruding segments and the syphon tube against the glass and some dead leaves and debris, or in the middle of the water trying to sweep off the encumbrance by twisting its own tail round over its head. During the whole of this seven minutes it never came near the surface of the water. Then, obviously fatigued, it came up and hung motionless with the remains of its victim still protruding from its mouth. This struggle to free itself had been carried on with the utmost vigour, and the sight of this larva with the one small segment crowned with the syphon and the dependent terminal segment and the gills protruding from its mouth as it charged round the jar was a most remarkable one.

After a minute's rest at the surface the cannibal evidently decided to take the final risk of bursting, and commenced slowly to eat again. There was not the eagerness and apparent relish about this end of the meal, nor did the jostlings of other larvæ move the eater from its position at the surface. So sluggish and fed up was it that it made no move or protest when another of its own kind and size attacked it viciously and actually chewed a whole bunch of hairs completely off one side of its thorax. In twelve minutes more it had eaten down to the junction of the syphon tube with the abdominal segment, and as it arrived there the syphon and the last segment fell separately from its mouth. It wriggled slowly to the bottom where it remained for a couple of minutes, exhausted, and then returned to the surface.

There, then, is one of the enemies of the mosquito larvæ. But even if anophelines behave at times in this way also, I doubt if the habit will be found of much practical value to the anti-malaria officer who may have been enticed to read as far as this.

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# REPORT OF THE CITY ANALYST AND BACTERIOLOGIST FOR THE YEAR 1935

The total number of specimens and samples of all classes submitted to the Public Health Laboratories during the year 1935 was 5,270.

The activities of the Laboratories have been maintained and comprised pathological specimens from (1) Colonial hospital, (2) Military hospital and Veterinary department, (3) Navy, (4) medical practitioners of Gibraltar, public health specimens (including samples taken under the "Food and Drugs Ordinance") and miscellaneous samples from the City Council, Police and the business community.

The number of samples examined and reported on exceeded that of any previous year, and was more than last year's number by 681.

The bulk of the work was directly connected with the health of the people.

An investigation into the source of the supply of water at the new well, No. 9, including its composition and purity, was undertaken. This was made the subject of a special report which was submitted to the Medical Officer of Health for his information.

No case of Leishmania occurred among the hounds of the Royal Calpe Hunt during the season, for the first time.

The report is divided into four parts as follows:—

Part I—Food and drugs, Public Health Ordinance.
Part II.—Miscellaneous.
Part III—Bacteriology, chemical pathology, and public health work.
Part IV—Testing of ships for inflammable gases.

## PART I—FOOD AND DRUGS.

### "The Public Health Ordinance."

The number of samples submitted under this heading was 109. Samples included goats' milks, cows' milks, spirits, ice creams, groceries and various drugs. Of the forty-five samples of milk examined ten were below the statutory limits in fat, or non-fatty solids. One sample of mercury ointment was deficient in mercury. In those cases where the City Council considered it advisable legal proceedings were taken. One vendor of milk was convicted for obstructing a food inspector by running away, thus preventing a sample of milk being taken. Fine and costs amounted to £5 3s. 0d. From the previous year two cases of imported milk containing 3 per cent. of unboiled milk were before the magistrate's court. Each was cautioned with costs of £1. Another case of imported milk containing 8 per cent. of unboiled milk was discharged by the magistrates in 1934. A high court appeal was brought in 1935 and was upheld. The vendor was fined £2 without costs. This case is of interest as actual demonstrations were conducted in both courts by the City Analyst. It was shown that a boiled milk gave no colour on the addition of ortol and hydrogen peroxide, but when the same test was applied to a boiled milk to which was added (in court) raw milk, thus making an 8 per cent. mixture, a marked red colour was obtained. Evidence was then given that a similar depth of colour was previously obtained with the sample.

Details of adulterated samples.

| Lab. No. | Sample | Fat | N.F.S. | Remarks. |
|---|---|---|---|---|
| 1368 | Goats' milk | 3.25 | 8.70 | fat deficiency 7% declared skimmed |
| 911 | ,, ,, | 3.20 | 8.85 | ,, ,, 9% ,, skimmed |
| 912 | ,, ,, | 3.10 | 8.80 | ,, ,, 11% ,, skimmed |
| 2010 | ,, ,, | 4.30 | 7.73 | equivalent to 3.8% added water |
| 2012 | ,, ,, | 4.40 | 7.81 | ,, ,, 2.4% ,, water |
| 2474 | ,, ,, | 3.20 | 8.30 | fat deficiency 8% declared skimmed |
| 2848 | ,, ,, | 3.55 | 6.75 | added water 15% Fine and costs £6.13.0 |
| 2849 | Cows' milk | 3.65 | 7.01 | added water 17% ,, ,, costs £6.13.0 |
| 2402 | Goats' milk | 3.46 | 6.38 | added water 20% ,, ,, costs £7.3.0 |
| 2404 | ,, ,, | 2.58 | 7.20 | added water 10% |
| 2801 | Mercury ointment | — | — | deficiency in mercury 7% |

The percentage of adulteration was 10. For comparison, the percentage below the standards set out in the Public Health Ordinance for the previous year was 23. Judging from the samples received, I am able to report a continued improvement in the quality of vended milk, but there is room for improvement. No sample of milk contained preservative, but an occasional sample showed evidence of being kept a day and then reboiled. No sample of imported milk was unboiled, and I was unable to find a small proportion of raw milk in any sample. This is very satisfactory.

### *Average Composition of milks.*

The average composition of goats' milk was :—

| | |
|---|---|
| Milk-fat ............... | 4.11 per cent. |
| Non-fatty solids ...... | 8.94 per cent. |

The statutory limits for goats' milk are, fat 3.5%, non-fatty solids 8.0%.

The average composition of cows' milk was :—

| | |
|---|---|
| Milk-fat ................ | 3.31 per cent. |
| Non-fatty solids ....... | 8.66 per cent. |

The statutory limits for cows' milk are, fat 3.0%, non-fatty solids 8.5 per cent.

### SPIRITS.

Samples of whisky, rum, brandy, and gin were received and examined. None were found to be diluted below the statutory limit.

### OLIVE OILS.

Eight samples were analysed and all were found to be genuine. The highest percentage of acidity was 1.62, and the lowest 0.92. It is satisfactory to know that the best quality of olive oil is now being sold. At one time most samples showed a very high acidity which must have been deleterious to health.

### GROCERIES.

Samples included tea, coffee, cocoa, butter, margarine cheese, sugar, pepper, tinned fish and tinned peas, etc. All were genuine. Butter and margarine did not exceed 16 per cent. of water.

### ICE CREAM.

From four different makers of ice cream samples were taken to ascertain the proportion of fat, if any, they contained. The results were as follows :—

| *Sample* | *Fat* per cent. |
|---|---|
| 1 | 5.5 |
| 2 | 3.0 |
| 3 | none |
| 4 | 2.8 |

There is at present no regulation controlling the presence of fat in ice cream and it is thought that all ice cream vended in Gibraltar should contain some fat.

MARGARINE.

Results of analyses of samples of margarine not taken under the Food and Drugs Ordinance gave the following figures.

| Sample | Water per cent. | Salt per cent. | Boric Acid per cent. |
|---|---|---|---|
| 1 | 12.44 | 2.91 | 0.31 |
| 2 | 16.47 | 2.83 | none |
| 3 | 16.38 | 2.92 | none |
| 4 | 11.76 | 2.88 | 0.24 |
| 5 | 11.80 | 2.84 | 0.08 |
| 6 | 15.16 | 2.84 | none |
| 7 | 12.04 | 2.94 | 0.20 |
| 8 | 16.20 | 2.79 | none |
| 9 | 15.97 | 3.26 | none |

CONDENSED MILK.

Numerous samples of condensed milk both sweetened and unsweetened and comprising most of the different brands sold in Gibraltar were analysed to determine whether they conformed to the law as regards composition and labelling. Labels shall contain in words and figures the equivalent in pints of milk contained by each tin. The following table shows the results obtained of condensed milks which were examined for the Army authorities under their contract regulations.

## CONDENSED MILKS.

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| Milk-fat % | 9.36 | 9.58 | 7.88 | 9.19 | 9.17 | 9.16 | 9.29 | 9.53 | 9.23 | 9.42 |
| Milk solids % | 32.44 | 32.12 | 32.56 | 31.88 | 32.60 | 31.39 | 32.14 | 32.70 | 33.10 | 33.1 |
| Tin contained—ozs. | 16.4 | 16.1 | 16.6 | 16.0 | 16.0 | 16.5 | 14.1 | 16.0 | 16.0 | 16.1 |
| Equivalent to pints of milk in tin | 2.1 | 2.1 | 1.8 | 2.0 | 2.0 | 2.1 | 1.83 | 2.1 | 2.1 | 2.1 |
| After 14 days incubation at 37°C. | sound | sound | sound | sound | sound | sound | sound | sound | sound | sound |
| Labelling of tin | correct | correct | says 2 pints | correct | correct | correct | — | sound | sound | sound |
| Adulteration | none | none | — | none | none | none | — | none | none | none |
| Preservatives | none | none | none | none | none | none | none | none | none | none |
| Lead, copper, iron | none | none | none | none | none | none | none | none | none | none |
| Tin (gr. per lb.) | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 | under 0.1 |

Sample C is deficient in milk-fat, with incorrect labelling.

Sample G--Label states tin contains 1.87 pints of milk—found 1.83 pints.

## PART II—MISCELLANEOUS.

Samples received for analysis and report which are placed under this heading numbered 134 and were as follows:—

1 condensed milk—for bacteriological examination.
3 samples condensed milk—estimation of lactic acid.
10 tins of different brands of condensed milk—for chemical analysis.
17 samples of different brands of margarine—for chemical analysis.
4 samples of tobacco—to determine if damaged by sea water or rain.
7 oil carrying ships—examination of tanks for inflammable gas.
13 articles of clothing—each to be tested for blood stains.
1 bottle of liquid—for identification.
1 stomach washout }
1 vomit } for detection and estimation of extraneous acid.
7 urines }
1 stools } for detection of cresols (Lysol).
1 stools of cat—toxicological analysis.
3 articles of clothing—examination for semen stains.
1 fluid in tumbler }
1 fluid in bottle } toxicological analysis.
1 intestines of dog }
1 liver of dog } toxicological analysis.
1 brain of dog—bacteriological examination.
1 rat poison—for identification of poison present.
1 urine sample—for detection of arsenic and poisonous metals.
6 samples of sweets—toxicological analysis.
1 sample of "lamella"—for detection of morphine.
3 samples of white powder—detection of suspected narcotic.
1 ampoule of liquid—detection of suspected narcotic.
1 sample dried milk—for rancidity.
2 samples granulated sugar—for purity.
1 sample candle—for analysis.
1 Aspirin tablet—for purity.
1 boiler scale—for analysis.
1 sample of soot—for analysis and calorific power.
5 samples coal—for analysis and calorific power.
15 cows' milks—for detection of tubercle bacilli.
1 tooth—bacteriological examination.
1 renal calculus—for analysis.
4 ice creams—bacteriological examination.
13 dipping fluids—for estimation of arsenic.

*Goods damaged by sea water or fresh water (rain).*

Samples from time to time are received for the above question to be settled by the chemist. Substances so far dealt with have been sugar, tobacco leaf, cardboard boxes, and paper. A certificate is required usually to assess damage, and also when legal proceedings are to be taken. A sample of the dry (undamaged) goods is always asked for by the analyst for comparison. Both samples are received in glass stoppered bottles to prevent drying. Moisture and chlorine are determined in each sample. The difference in the percentage amounts of water show the extent of the wetting at a glance. The percentage of chlorine in the damaged goods gives little information to advocates and judge except that it is in excess of the undamaged sample. If it can be shown that the proportion of extraneous chlorine to extraneous water is between 1,800 and 2,100 per 100,000 it is almost conclusive evidence that the sample had been damaged by sea water. If less it may be reasonably supposed that tidal river water caused the damage. Sometimes a higher proportion than 2,100 parts of chlorine to 100,000 of water is obtained. This shows drying out of water before the sample was taken. These points are mentioned in the certificate. Example—A sample of damaged tobacco leaf gave the following figures :—

| | *Moisture per cent.* | *Chlorine per cent.* |
|---|---|---|
| Undamaged sample .............. | 12.31 | 0.718 |
| Damaged sample .................. | 66.85 | 1.415 |

Calculation to determine the amount of extraneous chlorine contained by 100,000 parts of extraneous water :—

| | grms. | gms. water | gms. chlorine |
|---|---|---|---|
| Undamaged sample | 87.69 dried sample held | 12.31 | and 0.718 |
| | or 100 ,, ,, ,, | 14.04 | and 0.8818 |
| Damaged sample | 33.15 of dried sample held | 66.85 | and 1.415 |
| | or 100 ,, ,, ,, | 201.66 | and 4.2684 |

It follows that 187.62 (201.66 — 14.04) grams of excess water contained 3.4496 (4.2684—0.8188) grams of chlorine.

Therefore—100,000 parts of excess water contained 1,838 parts of excess chlorine. The opinion formed is that the tobacco had been damaged by sea water. After drying the samples at 100°C. for estimation of moisture, they were ashed and the ash extracted with water for estimation of chlorine volumetrically.

## NEW WATER SUPPLY—Well No. 9.

When a new underground supply of water is found and is intended for public use it is necessary to make investigations to determine the source of the supply, its quality, hardness, salinity, and purity, and possible sources of contamination. This entails analyses also of other well waters in the vicinity for comparison. A knowledge of the geology of the district is always helpful in explaining the mineral contents of the water. An effort was made to complete these investigations as far as possible. The results obtained and conclusions drawn were made the subject of a special report which was submitted to the Medical Officer of Health for his information. Abundant water is available and 7 million gallons were pumped during the summer of 1935. Comparison of analytical figures showed no connection between the North Front wells and wells in La Linea. It is not thought therefore that there is an underground stream running to Gibraltar from the Spanish sierras. In the dry season after much pumping the water at the bottom of No. 9 well contained 30 parts of chlorine per 100,000 parts of water while the top water contained only 4 parts (13-8-35). This means that two separate sources of supply enter the well. My conclusion is that the rains drain down through the upper sandy soil of the North Front area and gain access to the sand lying between two lime containing strata at 15 feet and 17 feet. Here this rain water is in contact with another supply of water which extends downwards through the soil. The salinity of the lower water increases with depth until it approximates half that of sea water at 35 feet (Sanitary water well—chlorine=950 parts per 100,000). In the dry season after much pumping both sources enter the well separately, one lying over the other. The effect of pumping in the dry season greatly depletes the upper rain water and its rate of flow is reduced. The lower supply with slowly increasing salinity then takes its place. After 30 inches of rain had fallen (February 1936) mixing of the two supplies took place before entering the well. Then it was found that the salinity was reduced from 30 parts to 6.8 parts of chlorine per 100,000 and was equally distributed in the water. The level of the water in the well rose 5 feet and was largely made up of the newly replenished rain water from the upper sandy soil. Wells Nos. 5, 7 and 8, it has been found, act in a similar way, but the rate of flow through the sand into No. 9 appears greater than into the other wells. At one time, after pumping, the less saline upper soil water in No. 8 was so depleted that only the more saline lower water (chlorine=30 pts.) was found in the well. When pumping ceased water from the upper soil again slowly entered. Evidence is available that when the chlorine content of natural waters in the vicinity of

Gibraltar exceeds 4.8 parts per 100,000 it is due to the presence of sea water. The temporary hardness (lime and magnesia) of No. 9 water is not excessive. It is derived from the stratum at 17 feet. The water did not always, especially after rain, reach the bacteriological standard required and it is therefore chlorinated for public safety. It is then clear and bright, without taste or smell, is bacteriologically pure and suitable for drinking. Results of some of the analyses performed in connection with this investigation are given and may be useful for reference.

| | Well No. 9 5-6-35 per 100.000 (June 1935) | Well No. 9 11-5-35 per 100 000 (June 1935) | Well Neutral Ground per 100.000 (June 1935) | Well No. 8 24-6-35 per 100.000 (Jnne 1935) | La Linea Hospital Well per 100.000 (June 1935) | Romero No. 1 Centre of La Linea 16-6-35 per 100.000 (June 1935) | Romero No. 2 Centre of La Linea 16-6-35 per 100.000 (June 1935) |
|---|---|---|---|---|---|---|---|
| Total Solids ... ... | 63.15 | 63.70 | 143.10 | 74.85 | 71.55 | 39.85 | 42.25 |
| Lime (Ca 0) ... ... | 10.10 | 10.75 | 18.90 | 13.35 | 14.40 | 10.08 | 10.10 |
| Magnesia (Mg 0) ... | 3.20 | 3.25 | 5.93 | 3.53 | 5.09 | 2.16 | 2.23 |
| Sulphates ($SO_4$ ) ... | 5.59 | 5.36 | 12.07 | 8 57 | 9.46 | 4.26 | 4.45 |
| Chlorine ... ... | 14.60 | 16 20 | 28.0 | 14.80 | 11.10 | 5.40 | 6.00 |
| Nitrites (N) ... ... | 0.004 | 0.024 | 0.015 | mere trace | 0.026 | traces | none |
| Nitrates (N)... ... | 1.20 | 0.68 | 4.44 | 1.80 | 1.00 | 1.00 | 1.30 |
| Temporary Hardness | 17.00 | 15.5 | 28.5 | 23.75 | 26.5 | 18 00 | 18.00 |
| Permanent Hardness | 7.75 | 7.55 | | 12.00 | 5.50 | 6.00 | 6.83 |
| Free Ammonia ... | 0.019 | — | 0.003 | + 0.055 | 0.006 | traces | 0.004 |
| Alb. Ammonia .. | 0.011 | — | 0.013 | 0.008 | 0.029 | 0.003 | 0.007 |
| Organisms 37° C. ... | 72 per c.c. | — | — | | Chlorinated | — | — |
| B, coli ... ... | not in 40 c.c<br>atypical in 50 c.c. | | | | | | |
| Reaction ... ... | P.H.=8.0 | —<br>P.H =8 0 | — | | Chlorinated | — | — |

Fermented saccharose (Acid+gas)

Suspected traces of ammonia from chlorinating apparatus.

*Fuentes de los Tajos—La Linea.*

Water percolating from rock at base of "Queen of Spain's Chair."

| | *Parts per* 100,000 |
|---|---|
| Chlorine | 4.8 |
| Lime (Ca O) | traces |
| Nitrates (N) | 0.14 |
| Nitrites (N) | none |

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Chlorine content of waters in and near Gibraltar in parts per 100,000.

| *Water* | *Chlorine* | |
|---|---|---|
| Erisa del Mesto (Los Barrios) | 2.8 | |
| La Salud | 3.8 | nitrates marked |
| La Granja | 2.8 | nitrates none |
| Algeciras public supply | 2.1 | |
| Almendral (San Roque) | 4.2 | |
| Hotel Victoria (Ronda) | 2.8 | |
| El Almidon (Polo ground) | 11.8 | nitrates very little |
| Mr. Larios' grounds (Pelayo) | 1.9 | |
| A Campamento well water | 32.4 | |
| Neutral ground well (June 1935) | 28.0 | nitrites=0.015 |
| Water percolating from rock base of hills behind La Linea | 4.8 | |
| No. 7 Well (N.F.) bottom (18.7.35) | 31.8 | nitrites=0.03 |
| do. top do. | 5.2 | |
| Cattle Sheds residence | 44.8 | |
| Catalan Bay well | 68.0 | |
| No. 1 Well (N.F.) | 900.0 | nitrites=0.002 |
| No. 2 Well (N.F.) | 510.0 | nitrites=0.002 |
| No. 5 Well (N.F.) bottom (18.7.35) | 31.1 | |
| do. top do. | 2.1 | |
| No. 3 Well (N.F.) | 752.0 | |
| Water coming through bore No. 1 tube | 1148.0 | |

*Well No.* 9 (*June* 1935).

The probable combination of the component parts obtained by analysis.

Parts per 100,000

| | | | |
|---|---|---|---|
| Ca | = 7.21 | Ca $CO_3$ | 17.00 |
| Mg | = 1.93 | Ca $SO_4$ | 0.98 |
| $SO_4$ | = 5.59 | Mg $SO_4$ | 6.29 |
| $CI_2$ | =14.60 | Mg $CI_2$ | 2.58 |
| $CO_3$ | =10.20 | Na CI | 20.91 |
| $NO_3$ | = 5.31 | Na $NO_3$ + $KNO_3$ | 8.66 |
| Na+K | =3.35 | Water of crystallisation + silica | 6.73 |
| | | | 63.15 |

## HOUNDS, ROYAL CALPE HUNT.

### (Canine Leishmania)

Again this year I am able to report on the effect of complete immersion of the hounds in an arsenical bath. The practice of dipping was started experimentally in 1934 to keep the hounds free of ticks, fleas, and lice and possibly biting flies. It is not known definitely what pest conveys the parasite of Leishmania to dogs, but the sandfly (genus *Phlebotomus*) is strongly suspected. Dipping, it was hoped, might eradicate this disease, which annually attacks these hounds with high mortality. Last year it was reported that though hounds were systematically dipped 10 died of canine Kala Azar. It was thought later that, as the incubation period of this disease is as much as a month or even more, dipping had been started too late in the season. With this possibility in mind, last year (1935) dipping was commenced one and a half months earlier and continued till August 10th at fortnightly intervals. It was found that fortnightly dipping was just as effective as weekly dipping (1934) in keeping the hounds free of ticks, lice and fleas. I am able to report also that no case of canine Leishmania occurred among the hounds numbering 30 couples. It is noticed that 1935 is the first year that hounds have been free of the disease. Though these are early days to say that systematic immersion in a weak arsenical fluid, together with the clearing of kennels from ticks, has had this beneficial effect, yet freedom from the disease for the first time coincides with the practice of dipping. This will be continued during the season 1936 and will be watched with interest. The change from weekly dipping to fortnightly dipping was made to avoid small sores which some hounds developed. No sores were noticed as the result of the change though hounds were dipped for a longer period. No other special precautionary measures were taken, such as sterilising food, etc., apart from an earlier dipping season. The strength of the dipping fluid was carefully controlled by fortnightly analysis and kept constant at 0.10 per cent. arsenious oxide.

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### *Toxicological and Forensic Examinations.*

1. Liquid in bottle was strong commercial hydrochloric acid, stomach washout and vomit also contained this acid.
2. Cresols (Lysol) were detected in seven urines and one stool.
3. Fluid in both a bottle and table glass was Lysol.

4. Stains, on three articles of clothing received from Chief of Police were not seminal in nature.
5. Stains on thirteen articles of clothing submitted by Chief of Police were of blood.
6. Arsenic and lead were not detected in a urine specimen.
7. Morphine was present in a sample of ''Lamella'' as expected.
8. Six samples of sweet contained no arsenic or poisonous metal.
9. Three suspected narcotics were received from the Chief of Police—each proved to be novocaine.
10. A suspected narcotic, submitted by Chief of Police, was a solution of morphine hydrochloride.
11. The active principle of a rat poison was phosphorus.
12. Viscera of a dog were free from poisons.

## PART III—BACTERIOLOGICAL, PATHOLOGICAL AND PUBLIC HEALTH WORK.

| | *No. of specimens.* |
|---|---|
| Drinking waters and others | 477 |
| Swabs: C. diphtheriæ and Vincent's organisms, &c. | 719 |
| Sputa: tubercle bacilli and causative organism | 117 |
| Bloods: Widal—T.A.B. and Br. Melitensis | 200 |
| Bloods: goats, Widal for undulant fever | 86 |
| Bloods: total count | 60 |
| Blood: smears for malaria, anthrax, piroplasmosis | 13 |
| Blood: cultures for enteric, streptococci, &c. | 27 |
| Blood: sugar estimations, sugar tolerance tests | 326 |
| Blood: Wassermann reaction | 787 |
| Blood: urea estimations, urea concentration factor | 58 |
| Blood: calcium estimations | 1 |
| Cerebro-spinal fluids: cytology, globulin, Wassermann, etc. | 19 |
| Pleural fluids: cytology, culture, &c. | 10 |
| Urines: analysis and bacteriological | 1,445 |
| Urines: urea estimations, urea concentration test | 92 |
| Pus: gonococcus, other causative organisms | 103 |
| Sera: from V.S. detection of Tr. Pallida | 4 |
| Breast milks: analysis | 20 |

| | |
|---|---|
| Fæces: bacteriological for enteric and dysentery organisms ........................................ | 193 |
| Rats: examination for plague ........................ | 98 |
| Gastric contents: including fractional test meal | 69 |
| Guineapig innoculations: virulence test of C. diphtheriæ ........................................ | 14 |
| Autogenous vaccines: prepared ...................... | 34 |
| Stock vaccines: diluted ................................ | 22 |
| Histological: cutting, fixing, staining sections... | 1 |
| Miscellaneous specimens ................................ | 25 |
| Total ... | 5,020 |

*Animal innoculations.*

These were chiefly confied to determining the virulence of diphtheria bacilli. Fourteen cultures obtained from either the throat, ears, or nose of patients were tested. Other organisms met with in the course of examinations, and having doubtful pathogenicity, are also tested by guinea-pig inoculation, as well as pathological specimens suspected of tubercle infection.

*Tubercle bacillus.*

A variety of specimens were submitted for bacteriological examination for tubercle bacilli—sputa, cerebro-spinal fluids, pleural fluids, urine, fæces, pus, and cows' milk. Of the 117 specimens of sputa examined, 15 contained these organisms. These include re-examination of treated cases.

Milk of cows on the "Rock" was tested periodically for tubercle bacilli with negative results.

*Venereal disease.*

The usual routine examinations of blood and cerebro-spinal fluids by Wassermann reaction, sera from primary sores for the presence of *Treponema pallida* by dark ground illumination method, and pus smears for gonococci were undertaken. Of the 787 bloods for Wassermann test 120 were positive, and of 103 pus smears examined for gonococci 19 were positive.

Urine specimens and smears obtained after prostatic massage were also examined for gonococci in some instances. Wassermann in preference to the Sigma test is practiced as it is more universally understood when interpreting results.

### *Dysentery.*

Many stools were examined for bacteriological evidence of the type of organisms causing the disease. Cases of bacillary dysentery were due chiefly to *B. dysenteriæ Flexner,* and the types encountered were "Sonne" and "Polyvalent." Morgan's bacillus was present in one case, and cysts of *Llamblia intestinalis* were present in another. The amoebic form of dysentery was not met with during the year. All stools are microscopically examined for the presence of pus and blood. Most of the stools received were diarrhoeic in character, in contrast to the true dysenteric stool containing pus and blood. The convalescent patient's stools are again examined to ensure he is not a "carrier" of the organism.

### *Enteric and undulant fevers.*

All human blood specimens which require agglutination tests were examined for typhoid ("O" and "H") fever, paratyphoid "A"; paratyphoid "B" fevers and undulant fever. The formalised standard emulsions and agglutinating sera prepared at Oxford University continue to give satisfaction and are reliable. Of the numerous bloods examined, 29 agglutinated for *B. typhosus* "H"; 5 for *B. typhosus* "O"; 11 for *B. paratyphosus B.;* and 4 for *Brucella Melitensis.* In connection with these diseases many stools, bloods and urines were culturally examined for the presence of the causative organism. The convalescent patient's stools and urine are again examined to ensure he is not a "carrier" of these organisms.

### *Diphtheria.*

In the examination of throat swabs only the Klebs-Loeffler bacillus is considered. Of the large number of swabs examined twenty-eight were new positive cases. The diphtheria germ was also found in two contacts. Virulence tests by guinea-pig innoculation were resorted to when patients persist in carrying the organism in spite of treatment. In eleven of such cultures taken from the throat, nose, or ear nine were found to be fully virulent—two of these being contact swabs. Swabs of convalescents are repeatedly examined until absence of the organism is reported in three consecutive swabs.

### *Vincent's angina.*

This ulcerative condition of the throat is not prevalent but all swabs of suspicious throats which were negative for *C. diphtheriæ* were examined for Vincent's organisms. Four were positive.

*Tuberculosis.*

Various specimens were received for detection of the tubercle bacillus—sputa, cerebro-spinal fluids, pleural fluids, urine, fæces, pus and cows' milk. Twelve per cent. of the 117 sputa examined contained the organism.

*Malaria.*

Blood smears of thirteen patients were examined for malaria parasites. One was positive.

*Blood examinations, &c.*

A variety of examinations come under this heading and include renal efficiency tests. Sugar tolerance tests, blood counts, examination of fractional test meals, cytological, chemical, and bacteriological examinations of pleural, and cerebro-spinal fluids, estimations of urea and calcium in blood, Van den Bergh's test in jaundice, analyses of urine, etc.

As a guide and control in insulin treatment diabetic patients visited the laboratory for blood sugar estimations.

Seven patients presented themselves at the laboratory for the complete sugar tolerance test, and the total number of blood sugar estimations performed was 326.

In connection with renal efficiency tests, 46 patients were examined for the urea concentration factor, and 21 for the urea concentration test. The total blood urea estimations performed were 58.

*Gastric disorders and fractional test meals.*

The analysis of gastric contents in the laboratory diagnosis of gastric ulcer, carcinoma, hypersecretion, etc., were undertaken. The examination entails the estimation of free hydrochloric acid and total acidity, and the detection of blood, pus cells, bile, starch and mucus in each specimen before and every fifteen minutes after taking the meal. Thirteen gastric contents are taken from each patient. In each case a curve is plotted showing the percentages of free and total acidity in relation to the fifteen minutes interval. Five patients were examined by this method making a total of 69 contents examined.

*Drinking water and others.*

Constant supervision of Gibraltar's dietetic waters necessitates numerous bacteriological examinations. The city's public supply was tested monthly (each reservoir separately). It remained unpolluted throughout the year. A large number of houses collect water in their own underground tanks. When contamination is suspected a sample is referred to the laboratories. Most of the military private tanks are systematically examined yearly.

Private tanks tested numbered 203. A strict supervision of imported table waters (bottled) is exercised.

*Distilled water.*

| | |
|---|---|
| Gallons received from Colonial hospital | 825 |
| Gallons sold to the public .................. | 518 |
| Gallons used in the laboratories ........... | 307 |

*Autogenous vaccines.*

These were prepared chiefly in cases of cystitis, eczema, and nasal and bronchial catarrh at the request of medical practitioners for their private patients.

*Distribution of specimens.*

Specimens submitted were derived as follows:

From Colonial hospital 1,043; from military authorities 801; from naval authorities 413; from Spain 77; and from City Council and general public 2,936—Total 5270.

NOTIFIABLE DISEASES—

The Table given below shews the nature and number of specimens examined and results obtained in connection with notifiable and venereal diseases:—

| | Total | Positive |
|---|---|---|
| Blood—Wassermann reaction .............. | 787 | 120 |
| Blood—Widal (for enteric and undulant fevers) | | |
| B. typhosus "O" | 200 | 5 |
| B. typhosus "H" | | 29 |
| Paratyphoid "A" | | — |
| Paratyphoid "B" | | 11 |
| Br. Melitensis | | 4 |
| Blood for malaria ............................ | 13 | 1 |
| Sputum—tubercle bacillus .................... | 117 | 15 |
| Pus—gonococci ................................ | 103 | 19 |
| Swabs—C. diphtheriæ ........................ | | |
| Throat | 719 | 137 |
| Nose | | 6 |
| Ear | | 3 |
| Serum—Tr. pallida ... ........................ | 4 | — |
| Cerebro-spinal fluid—Wassermann ........ | 19 | 1 |
| Fæces dysentery and enteric organisms— | | |
| B. dysenteriæ Flexner | 193 | 15 |
| B. Morgan No. 1 | | 1 |
| B. typhosus | | 1 |

## PART IV—TESTING OF SHIPS.

The City Analyst is entrusted with the testing of compartments of oil carrying tankers and others for inflammable and poisonous vapours. Gas free certificates are necessary before ships of this class enter dry dock for repairs. Eight tankers were examined.

A. Geo. Holborow, F.I.C.,

City Analyst and Bacteriologist

## DISTRIBUTION OF SPECIMENS.

| Nature of Specimen. | Civil. | Spain | Military. | Navy from Military Hospital. | Navy. | Colonial Hospital. | Total. |
|---|---|---|---|---|---|---|---|
| Blood, Wassermann ... ... | 168 | 5 | 227 | 3 | 210 | 174 | 787 |
| Blood Widal ... ... ... | 120 | ... | 33 | 13 | 1 | 33 | 200 |
| Blood, count ... ... ... | 41 | 1 | 1 | ... | 1 | 16 | 60 |
| Blood smears ... ... ... | 9 | ... | ... | ... | 2 | 2 | 13 |
| Blood sugar ... ... ... | 120 | 1 | 22 | ... | 1 | 182 | 326 |
| Blood urea ... ... ... | 29 | 1 | 9 | 4 | ... | 15 | 58 |
| Blood culture ... ... ... | 2 | 1 | 14 | 9 | ... | 1 | 27 |
| Blood goats' for Br. M. ... | 86 | ... | ... | ... | ... | ... | 86 |
| Fæces ... ... ... ... | 31 | 1 | 78 | 29 | 6 | 48 | 193 |
| Urine, concentration test ... | 76 | ... | 1 | ... | ... | 15 | 92 |
| Urine analysis ... ... ... | 1022 | 49 | 51 | 33 | 12 | 278 | 1445 |
| Sputum ... ... ... ... | 57 | 1 | 3 | ... | 1 | 55 | 117 |
| Cerebro-spinal fluid ... ... | 3 | ... | 9 | 2 | ... | 5 | 19 |
| Pleural fluid ... ... ... | 1 | ... | 4 | 5 | ... | ... | 10 |
| Serum from V.S. ... .. | ... | ... | ... | ... | 4 | ... | 4 |
| Swabs for K.L.B. &c ... ... | 457 | . | 62 | 8 | 13 | 179 | 719 |
| Stock vaccine ... ... ... | 22 | ... | ... | ... | ... | ... | 22 |
| Autogenous vaccines ... ... | 16 | 2 | 8 | 5 | 1 | 2 | 34 |
| Gastric contents ... ... | 1 | ... | 53 | 13 | ... | 2 | 69 |
| Pus ... .. ... .. ... | 56 | ... | 15 | 3 | 3 | 26 | 103 |
| Coal ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | 5 |
| Waters ... ... ... ... | 292 | 15 | 148 | ... | 22 | ... | 477 |
| Guinea pig innoculation ... | 3 | ... | 3 | 1 | ... | 7 | 14 |
| Rats for Plague... ... ... | 98 | ... | .. | ... | ... | ... | 98 |
| Food and Drugs Act ... ... | 109 | ... | ... | ... | ... | ... | 109 |
| Other foods & drinks, ... | 32 | ... | 31 | ... | ... | ... | 63 |
| Breast milk ... ... ... | 19 | ... | ... | ... | ... | 1 | 20 |
| Histological ... ... ... | ... | ... | 1 | ... | ... | ... | 1 |
| Blood Calcium .. ... ... | 1 | ... | ... | ... | ... | ... | 1 |
| Miscellaneous .. ... ... | 16 | ... | 28 | ... | 8 | 2 | 98 |
| Total ... ... | 2,936 | 77 | 801 | 128 | 285 | 1043 | 5270 |

## RESULTS OF MONTHLY ANALYSES OF GIBRALTAR DRINKING WATER—1934.

(Governor's Parade Fountain)

| Date | Chlorine (parts per 100,000). | B. Coli |
|---|---|---|
| Jan. 18 | 1·1 | Present in 10. c.c. |
| Mar. 2 | 2·0 | Present in 1. c.c. |
| April 1 | 2·0 | Present in 0.1 c.c. |
| May 20 | 2·1 | not found in 25. c.c. |
| June 12 | 3·6 | not found in 25. c.c. |
| July 17 | 17·8 | not found in 30. c.c. |
| Aug. 28 | 5·0 | Present in 10. c.c. |
| Oct. 2 | 9·0 | Present in 10. c.c. |
| Nov. 4 | 9·0 | not found in 25. c.c. |
| Dec. 13 | 3·0 | Present in 20. c.c. |

At no time did the reservoirs in use for supply of drinking water shew the presence of B. coli in 25 c.c.

At the beginning of the year a minor contamination occurred at one of the supply fountains. This was satisfactorily cleared up and has not since recurred.

## MONTHLY CHLORINE CONTENT OF WELLS (Nos. 8 & 9), BRACKISH AND SEA WATERS IN PARTS per 100,000.

| 1935 | Nos. 8 & 9 Wells. | Brackish Water. | Sea Water. |
|---|---|---|---|
| Jan. | 16·0 | 800 | 2,100 |
| Feb. | — | — | — |
| March | 17·2 | 790 | 2,150 |
| April | 14·0 | 780 | 2,010 |
| May | 12·4 | 770 | 2,010 |
| June | 13·6 | 870 | 2,100 |
| July | 15·0 | 1,000 | 2,070 |
| August | 15·0 | 990 | 1,990 |
| Sept. | 13·6 | 1,310 | 2,040 |
| Oct. | — | — | — |
| Nov. | 13·0 | 950 | 2,100 |
| Dec. | 14·0 | 980 | 2,100 |

# REPORT OF THE VETERINARY ADVISER

Contagious disease occurring amongst animals in Gibraltar during the year under review consisted of an outbreak of Foot and Mouth disease in a consignment of Moroccan slaughter cattle and a mild coughing epidemic in horses. Details of these outbreaks are embodied in the report.

## HORSES, MULES AND DONKEYS—

Eleven horses were imported by sea into the Colony during the year and were examined on landing and found free from disease. Their countries of origin were :—

| | |
|---|---|
| Tangier | 7 |
| England | 4 |

There were, in addition, a number of horses, mules and donkeys imported from Spain, but no records are kept of these imports.

Animals examined prior to export and their destinations were :—

| | |
|---|---|
| To Morocco | 90 |
| England | 9 |
| South Africa | 1 |
| India | 1 |

An outbreak of coughing and laryngitis occurred in horses during the months of November and December. A large percentage of horses in the Colony were affected and the disease spread rapidly but was of a mild type recovery taking place in ten to fourteen days in the majority of cases.

## CATTLE FOR SLAUGHTER—

The numbers imported and their countries of origin were :

| | Spain | Morocco | Denmark | Ireland |
|---|---|---|---|---|
| Cattle | 97 | 942 | 208 | 220 |
| Sheep | 1086 | — | — | 118 |
| Pigs | 232 | 332 | — | 55 |

These animals were inspected on arrival and were generally in good condition.

An outbreak of Foot and Mouth disease occurred in December in a batch of twenty-two Moroccan cattle for slaughter. The disease was of a mild type and was controlled by strict isolation and rapid slaughter. The following parts of carcases were condemned as unfit for human consumption :—

| | |
|---|---|
| Heads | 4 |
| Feet | 16 |
| Paunches | 4 |

Exports of cattle during the year were :—

| | |
|---|---|
| Cattle | 28 (to Morocco) |
| Sheep | 57 (to Shipping) |

MILCH COWS AND GOATS—

| | |
|---|---|
| Cows—Imports | 10 |
| Exports | Nil |

All milch cows and goats were inspected during the year and found in a satisfactory state of health.

Newly imported milch cows and any cows showing clinical symptoms of tuberculosis were tested with tuberculin. Seven reactors were destroyed during the year and the diagnosis confirmed by post mortem examination. Doubtful reactors had samples of milk examined periodically for the presence of T.B.

DOGS AND CATS—

No cases of rabies occurred during the year. The policy of keeping under observation all dogs and cats biting or scratching persons was continued during the year and on this account twenty-seven dogs and nine cats were detained at the observation kennels for periods varying up to fifteen days according to the recommendations of the Veterinary Adviser.

The Muzzling Order was continued in force throughout the year and is no doubt the chief deterrent to the spread of rabies in the Colony.

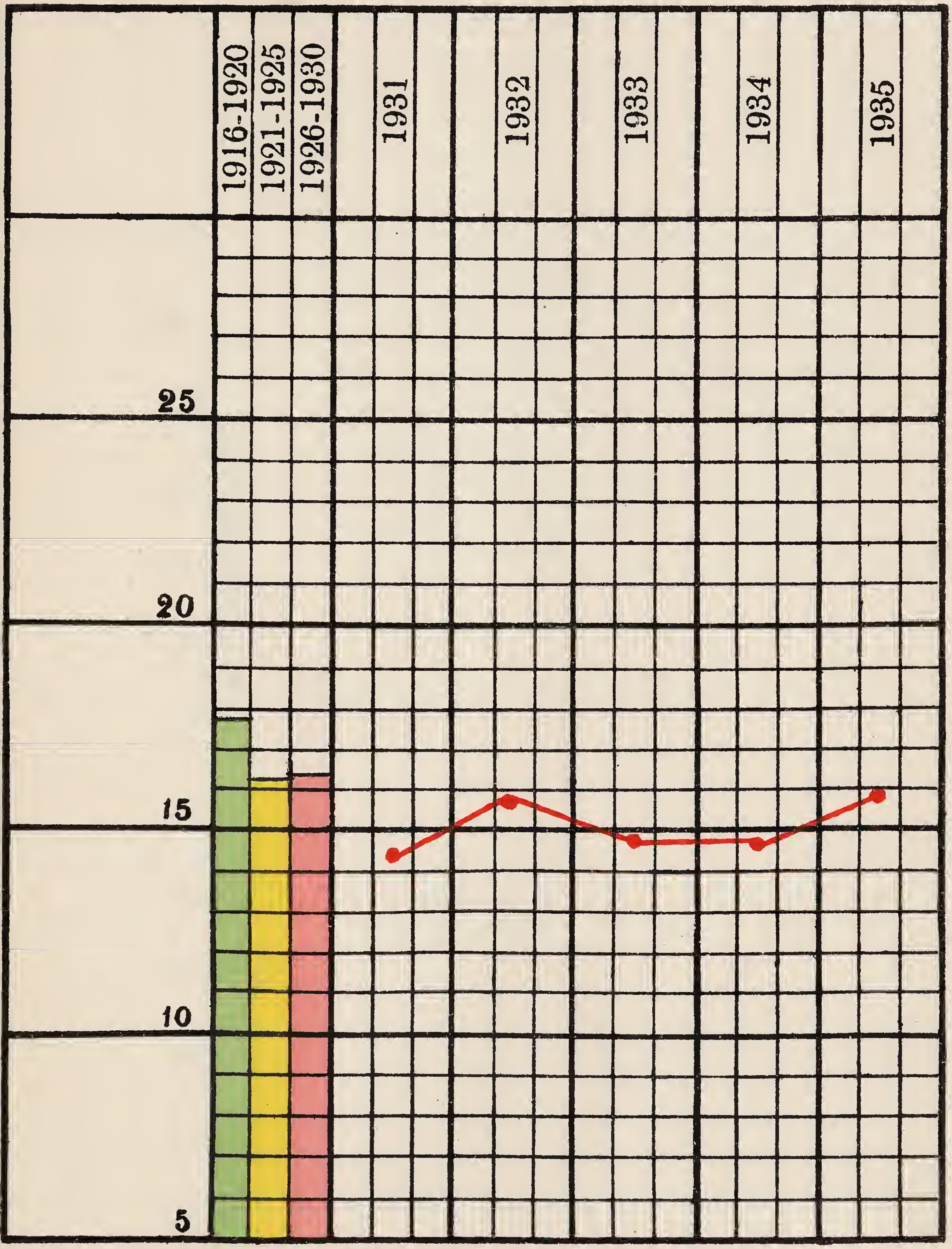
Details of dogs and cats undergoing isolation, etc. :—

| | Dogs | Cats |
|---|---|---|
| (a)—Number detained for isolation owing to having bitten persons or animals ... | 27 | 9 |
| (b)—Number destroyed | 63 | 267 |
| (c)—Number imported from the United Kingdom without undergoing quarantine | 9 | 1 |
| (d)—Number imported from other countries which underwent quarantine of six months or less | 5 | 5 |

A new Isolation Kennel for dogs and cats suspected of rabies was constructed at Rosia. The kennel can accommodate seven dogs and cats. A Veterinary Inspection Room was built at the Sick Lines, Rosia, for the inspection of animals, other than Army animals, by the Veterinary Adviser.

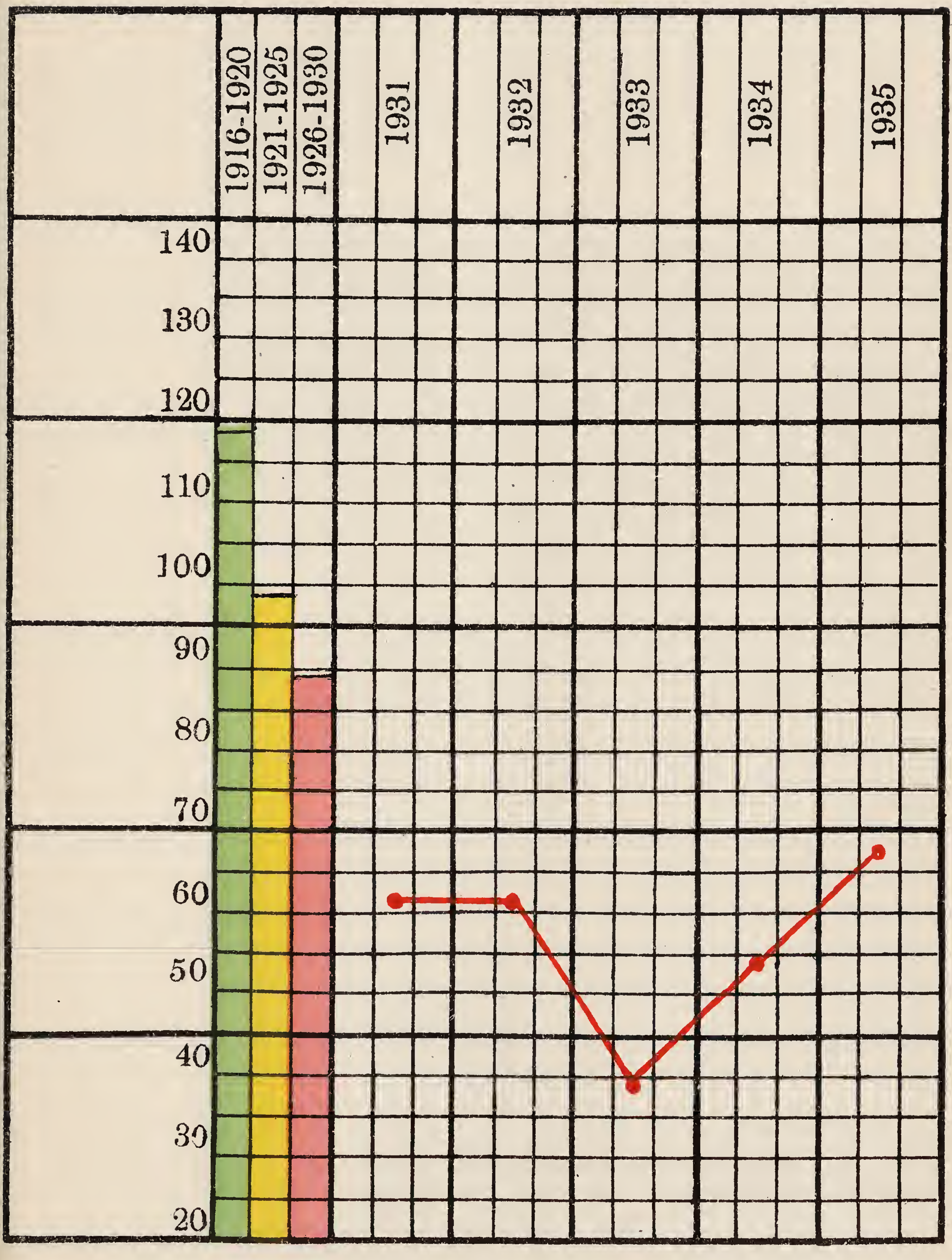
E. S. W. PEATT,
Major R.A.V.C.,
Veterinary Adviser.

# General Death Rate per 1,000 of Population (Total Civil) Gibraltar, for the Decennial Periods 1916-1925 and 1926-1935



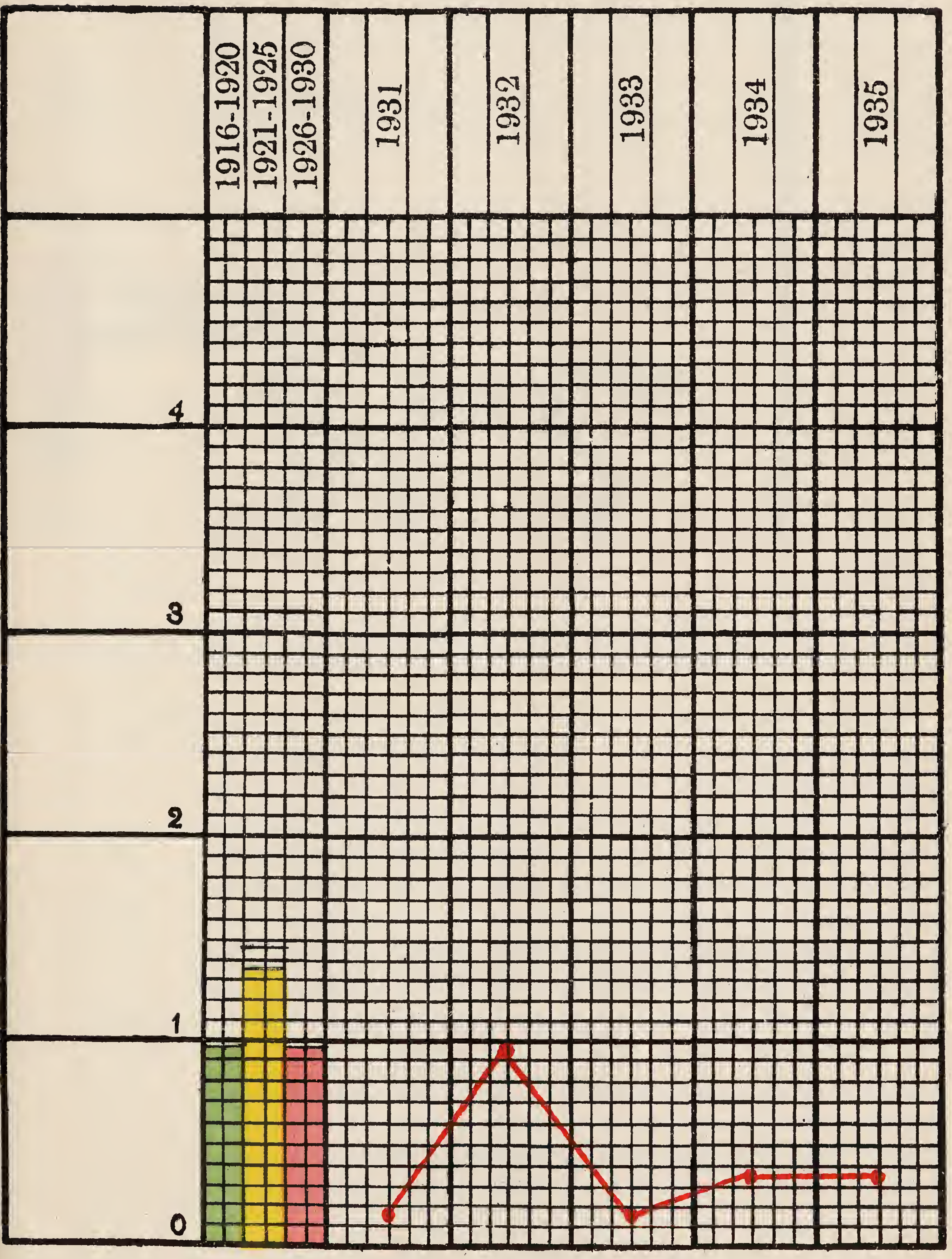
| | | | | |
|---|---|---|---|---|
| Average | 1916-1920 .... | 17.7 | 1926-1930 .... | 16.2 |
| | 1921-1925 .... | 16.1 | 1931-1935 .... | 15.0 |
| | 1916-1925 .... | 16.9 | 1926-1935 .... | 15.6 |

# Infantile Mortality per 1,000 Births, Gibraltar, for the Decennial Periods 1916-1925 and 1926-1935

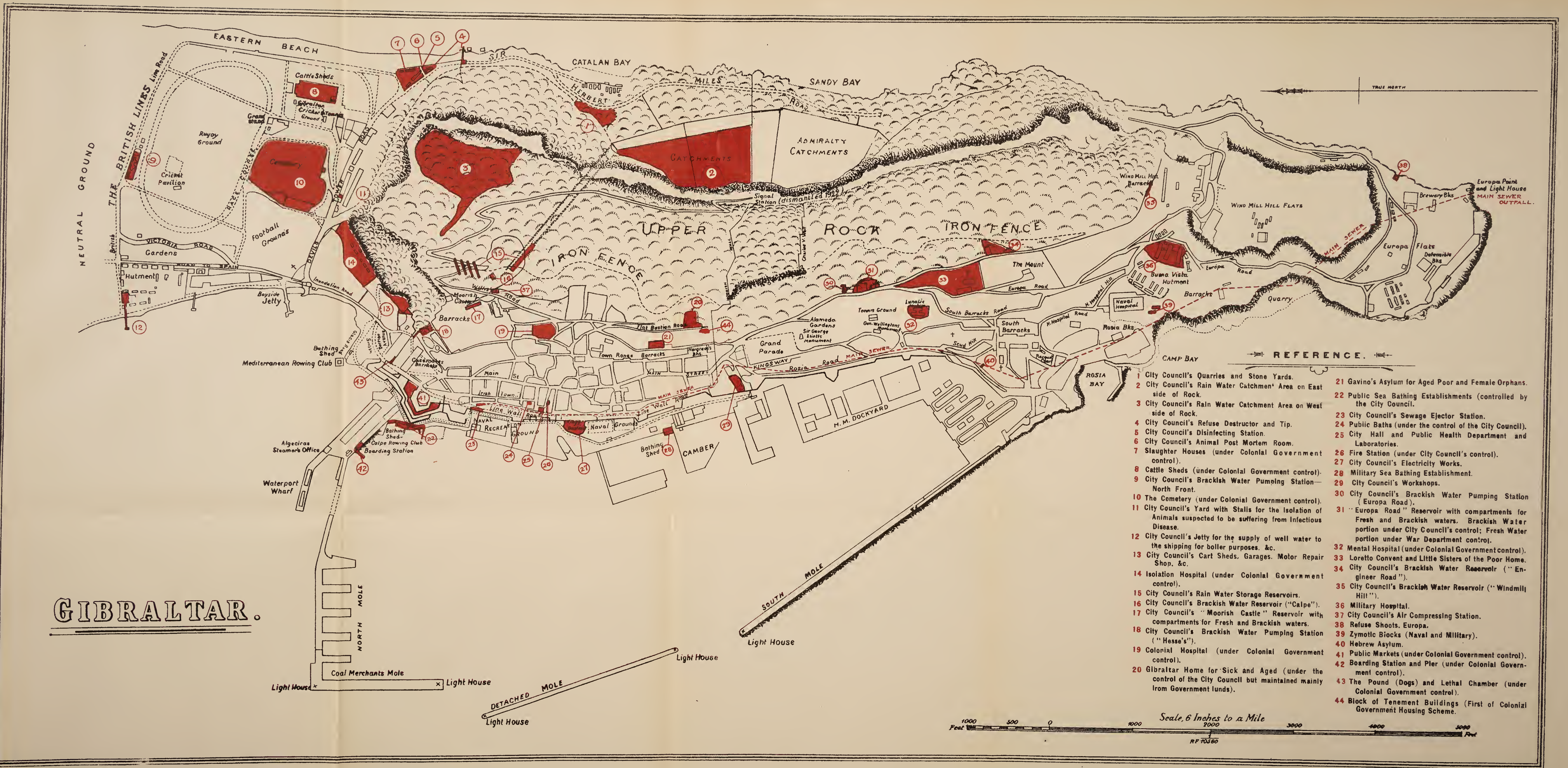


| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Average | 1916-1920 | .... | 119.4 | 1926 1930 | .... | 89.5 |
| | 1921-1925 | .... | 97.7 | 1931-1935 | .... | 56.6 |
| | 1916-1925 | .... | 108.6 | 1926-1935 | .... | 73.0 |

# Zymotic Mortality per 1,000 of Total Civil Population, Gibraltar, for the Decennial Periods 1916-1925 and 1926-1935



| | | | | | | |
|---|---|---|---|---|---|---|
| Average | 1916-1920 | .... | .99 | 1926-1930 | .... | .96 |
| | 1921-1925 | .... | 1.37 | 1931-1935 | .... | .40 |
| | 1916-1925 | .... | 1.18 | 1926-1935 | .... | .68 |



# GIBRALTAR.

## REFERENCE.

1 City Council's Quarries and Stone Yards.
2 City Council's Rain Water Catchment Area on East side of Rock.
3 City Council's Rain Water Catchment Area on West side of Rock.
4 City Council's Refuse Destructor and Tip.
5 City Council's Disinfecting Station.
6 City Council's Animal Post Mortem Room.
7 Slaughter Houses (under Colonial Government control).
8 Cattle Sheds (under Colonial Government control).
9 City Council's Brackish Water Pumping Station—North Front.
10 The Cemetery (under Colonial Government control).
11 City Council's Yard with Stalls for the Isolation of Animals suspected to be suffering from Infectious Disease.
12 City Council's Jetty for the supply of well water to the shipping for boiler purposes. &c.
13 City Council's Cart Sheds, Garages. Motor Repair Shop. &c.
14 Isolation Hospital (under Colonial Government control).
15 City Council's Rain Water Storage Reservoirs.
16 City Council's Brackish Water Reservoir ("Calpe").
17 City Council's "Moorish Castle" Reservoir with compartments for Fresh and Brackish waters.
18 City Council's Brackish Water Pumping Station ("Hesse's").
19 Colonial Hospital (under Colonial Government control).
20 Gibraltar Home for Sick and Aged (under the control of the City Council but maintained mainly from Government funds).
21 Gavino's Asylum for Aged Poor and Female Orphans.
22 Public Sea Bathing Establishments (controlled by the City Council.
23 City Council's Sewage Ejector Station.
24 Public Baths (under the control of the City Council).
25 City Hall and Public Health Department and Laboratories.
26 Fire Station (under City Council's control).
27 City Council's Electricity Works.
28 Military Sea Bathing Establishment.
29 City Council's Workshops.
30 City Council's Brackish Water Pumping Station (Europa Road).
31 "Europa Road" Reservoir with compartments for Fresh and Brackish waters. Brackish Water portion under City Council's control; Fresh Water portion under War Department control.
32 Mental Hospital (under Colonial Government control).
33 Loretto Convent and Little Sisters of the Poor Home.
34 City Council's Brackish Water Reservoir ("Engineer Road").
35 City Council's Brackish Water Reservoir ("Windmill Hill").
36 Military Hospital.
37 City Council's Air Compressing Station.
38 Refuse Shoots. Europa.
39 Zymotic Blocks (Naval and Military).
40 Hebrew Asylum.
41 Public Markets (under Colonial Government control).
42 Boarding Station and Pier (under Colonial Government control).
43 The Pound (Dogs) and Lethal Chamber (under Colonial Government control).
44 Block of Tenement Buildings (First of Colonial Government Housing Scheme.

BEANLAND, MALIN & Co. Gibraltar.

Map Reproduced from "The Gibraltar Directory."